Product documentation

Smart Panel 5.1 KNX
Art. No. SP 5.1 KNX

Start
Licht
An
Anwesenheit
Welcome
Wohnzimmer
Küche
Bad
Kinderzimmer

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1 Product definition

1.1 Product catalogue

Product name:	Smart Panel 5.1
Use:	Controller
Design:	FM (flush-mounted)
Art. No.	SP 5.1 KNX

1.2 Function

The device is used primarily to display statuses with a KNX installation and to control system functions. The display elements are shown on a colour TFT monitor at a resolution of 640 x 480 pixels (14.5 cm [5.7"], 4:3). The elements are controlled by touching the TFT monitor (touch screen).
Embedded-Linux Poky/Yocto serves as the operating system of the KNX Smart Panel 5.1 (article no. SP5.1KNX).
The KNX Smart Panel 5.1 has a powerful freescale processor and works on an embedded Linux operating system.
This product documentation describes the functions of the KNX Smart Panel 5.1.
The device has different interfaces for communication (KNX bus connection, Ethernet network connection) and for the connection of optional peripherals (USB port).

The device displays all KNX functions clearly and concisely. By touching it is possible to execute functions such as switching, dimming and Venetian blind control, to save and recall light scenes as well as visualize and evaluate complex functions such as value transmitter, date and limiting values.
A clear and comprehensible menu navigation ensures fast access to the desired functions. The use of predefined display pages available in the configuration software via a template library makes it possible to project design and commission the device in a uniform layout quickly and in a customer-friendly way.
In addition to the predefined display interfaces, freely programmable screen pages can also be used according to customer requirements. Coloured images, in BMP and JPG format, can then be included as wallpapers to aid desktop design, and can also be used as icons.

A synchronisable real-time clock is available for setting up time switch functions and for logging events. Events or any other actions can be forwarded by a switching command using predefined e-mails. Furthermore, the device can be integrated into different light-scenes whose brightness values can be saved permanently in the device memory for situation-dependent control of a lighting system for KNX actuator groups.
The device can be used to implement presence simulation and datalogger functionality. The presence simulation can, for example give those outside the impression that a house is lived in, even though the owners are away. The owners can record any simulations over periods of time and play them back at any time. The datalogger provides the option of recording data, received from the KNX, in various formats, and displaying them on the unit. The data recorded by the datalogger can also be forwarded by e-mail.
If necessary, a signalling system can provide a security-orientated system to monitor doors and windows. Up to two different signalling areas (internal / external) can be armed and monitored for break-ins and sabotage. Thus visual and acoustic alarming is possible using additional KNX components (e.g. switching actuators) in conjunction with alarm encoders (flash light, internal siren).

Up to 5 password levels allow controlled access to different functions. It is possible here to assign one of four password levels to the screen pages. The signalling system can be protected against unauthorized access by its own password.

Commissioning is possible by IP via the ethernet interface or via memory access (USB memory stick, network drive).

The device has a mains voltage terminal for power supply to the device electronics. The KNX function part (BCU) is functional as long as mains voltage and bus voltage are switched on. The device can be switched to an idle state to enable energy-saving operation, as in the case of prolonged absence for instance. Different KNX functions (e.g. signalling system, presence simulation, timer...) remain active even when the device is switched to idle state. If a device is switched off, display and signalling functions are deactivated permanently.

1.3 Accessories

Flush-mounted recessed box	Art. No. EBG 24
Frame for Smart Panel 5..	Art. No. .. 781 ..
Frame for Smart Panel 5..	Art. No. R 5 .. E

2 Installation, electrical connection and operation

2.1 Safety instructions

Electrical equipment may only be installed and fitted by electrically skilled persons. The applicable accident prevention regulations must be observed.

Before working on the device or exchanging the connected loads, disconnect it from the power supply (switch off the miniature circuit breaker), otherwise there is the risk of an electric shock.

Do not operate the screen with sharp or pointed objects. The touch-sensitive surface could be damaged.

Do not use sharp objects for cleaning. Do not use sharp cleaning agents, acids or organic solvents.

Failure to observe the instructions may cause damage to the device and result in fire and other hazards.

2.2 Device components

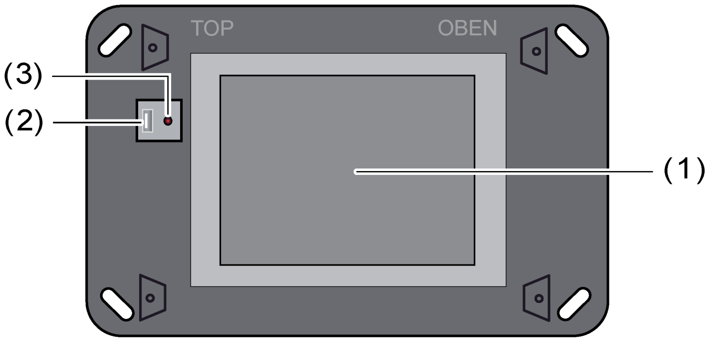


Figure 1: Device components, front side

(1) Colour TFT monitor (touch screen)
(2) USB socket for additional periphery (1 x type A)
(3) Reset button

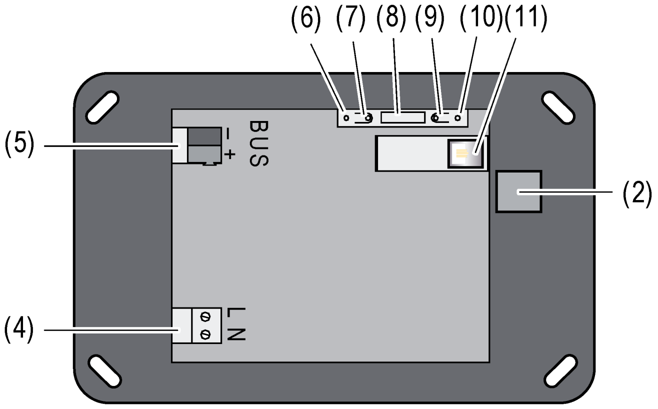


Figure 2: Device components, rear side

(4) Mains voltage connection
(5) KNX/EIB bus connection
(6) Programming LED (red)
(7) Programming button
(8) Service interface
(9) Reset button
(10) LED for Ethernet connection (link and activity status)
(11) 8-pin Ethernet connection sockets

ℹ The programming button and LED are only accessible from the rear side of the device. If possible, load the physical address into the device before the final installation (see chapter 2.4. Commissioning).

ℹ The reset buttons placed on the front part of the device (3) and the back of the device (9) have the same function.

Dimensions:
approx. width (B): 220 mm / height (H): 140 mm / depth (D): 48 mm
Without decorative cover frame and flush-mounted installation housing.

2.3 Fitting and electrical connection

⚠ **DANGER!**

Electrical shock when live parts are touched.

Electrical shocks can be fatal.

Before working on the device, disconnect all the corresponding miniature circuit breakers. Cover up live parts in the working environment.

Connecting and fitting the device

ℹ Recommendation: Install at eye-level, for optimal reading. (suggested installation height: 1.50 metre)

ℹ During installation, use the original installation housing (Jung article no. EBG 24), in order to maintain the protection class II.

Installation in panel-mounted housing.

- Mount the installation housing (12) in the right position - aligned horizontally or vertically - in the wall (masonry or cavity wall).
  Horizontal installation: Arrow **OBEN TOP** points upwards. Vertical installation: Arrow **OBEN TOP** points to the left.

The device has a mains voltage terminal for power supply to the device electronics. The KNX function part (BCU) is functional as long as mains voltage and bus voltage are connected and switched on.

- Insert the connecting cables through the designated bushings into the housing.

⚠ **DANGER!**

Electrical shock when live parts are touched. The mains voltage and low voltage are located in a shared appliance box. If there is an error, other connected components may carry mains voltage.

Electrical shocks can be fatal.

Always secure the mains voltage with the enclosed tube.

Run the cables so that low voltage wires are securely protected against mains voltage.

- Strip the mains voltage cable to the length of the enclosed silicon tube.
- Pull the supplied silicon tube over the stripped mains voltage wires **L** and **N**.
- Connect mains voltage AC 230 V ~ to the terminals **L N** (4).
- Connect the KNX bus line to the **BUS** terminal (5).
- Optional: Connect USB devices to terminal (2).

ℹ The Ethernet connection on the device is carried out according to EIA/TIA-568-B.

- Connect the Ethernet cable to the network connection (11).
- Install device in panel-mounted housing. Use the screws supplied.
- Remove protective film from the touchscreen surface (1).

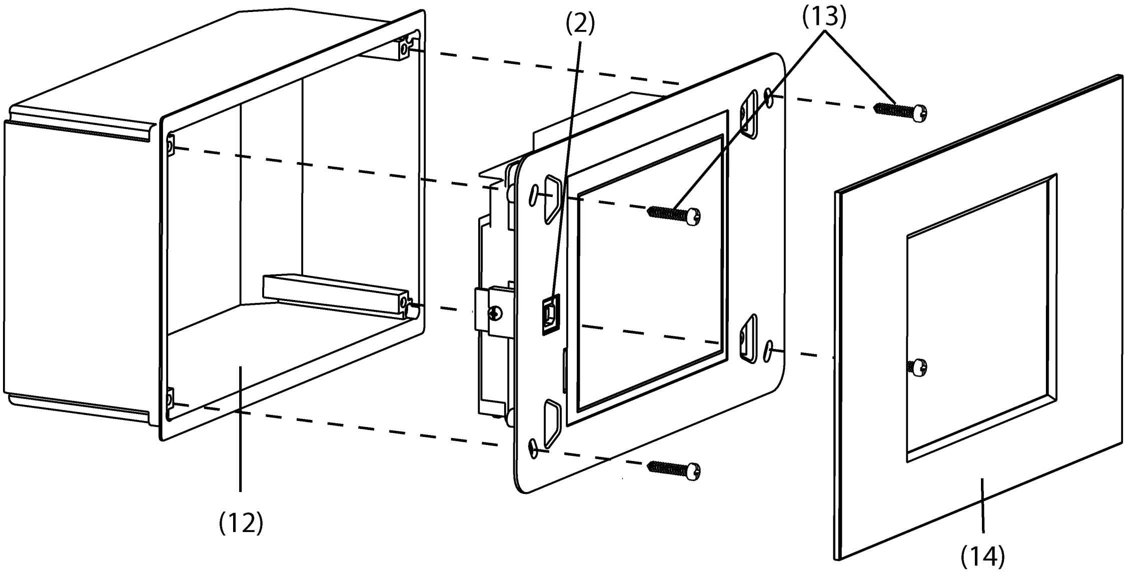


Figure 3: Mounting with installation housing and decorative cover

(12) Panel-mounted housing
(13) Screws to fasten the device in the panel-mounted housing (enclosed)
(14) Design frame

- Insert the device in the installation housing (12) and fix it. Use the screws (13) provided.

ⓘ Before inserting the device in the installation housing, load the physical address to the device using the ETS (see chapter 2.4. Commissioning).

ⓘ Before inserting the device in the installation housing, ensure that no cables are crushed or bent.

- Attach and press on the design frame (14).

ⓘ Do not attach the decorative frame if the device is still to be programmed with the project planning data after mounting. The USB connection socket of the panel must be accessible on the front of the device.

Removing the Design frame

The Design frame is removed by pulling off the frame evenly.

ⓘ Be careful when removing the frame, as the Design frame may break.
ⓘ To prevent damage to the frame, do not use any tools.

- Grip the Design frame securely with both hands.
- Pull off the Design frame slowly and carefully.

2.4 Commissioning

Commissioning

After installation of the device and connection of the KNX bus line, mains supply, Ethernet cable, and, if necessary, the optional periphery, the device can be put into operation. The commissioning is basically confined to programming of the physical address with the ETS and the loading of the configuration data by the configuration software.

Programming the physical address

The physical address is programmed using a KNX data interface in the ETS programming.

Programming button (7) and LED (6) must be accessible.

In addition, the ETS project database must be imported and an appropriate device inserted in the project and a physical address assigned.

- Switch on the mains supply of the device.

  The device switches on the display and starts the booting process. After the operating system has been loaded, the device starts the KNX application and first displays the start screen. After a short waiting time, the project design last programmed in the device is displayed.
- Press the programming button (7).

  The programming LED (6) is illuminated.
- Program the physical address with the help of the ETS.

  The programming LED goes out if programming has been successful.
- Note the physical address on the device.

ⓘ When the physical address has been programmed, the device can finally be mounted.

Programming the configuration data

After the physical address has been programmed, the configuration data must be programmed into the device. The device is configured with the aid of the separate configuration software. Commissioning is possible by IP via the ethernet interface or via memory access (USB memory stick).

ⓘ Preset IP address at delivery: 192.168.178.113.

ⓘ The ETS programming function (IP, USB or RS232 data interface) cannot be used for programming the configuration data.

If necessary, remove the decorative frame installed during mounting from the front of the device.

- Switch on the device.

  The device switches on the display and starts the booting process. After the operating system has been loaded, the device starts the KNX application and first displays the start screen. After a short waiting time, the project design last programmed in the device is displayed.
- Open the configuration software.
- The device is configured and parameterized with the aid of the configuration software.
- When the project design has been completed, carry out the programming operation.

  The progress of the programming operating is shown in the display of the device. When the programming operation has been completed, the device is initialised automatically. The Start screen is displayed during initialisation.

- This completes the commissioning process.

2.5 Operation

2.5.1 Touch surface

Sensoric touchscreen surface

The monitor possesses a sensoric surface, also know as a touch screen. The device is operated by touching the monitor surface with your finger or with special touch screen pens (not contained in the scope of supply).

ℹ Do not use sharp objects for operation. The surface may be damaged and thus operation impeded.

Cleaning the touchscreen

The touchscreen requires regular cleaning in order to guarantee the optimum touch sensitivity. Keep the screen free of foreign bodies and dust.

- Set application to "Cleaning function".
- Clean the touchscreen carefully using a soft, lint-free cloth. If needed, moisten the cleaning cloth slightly.

ℹ Do not use sharp cleaning agents, acids or organic solvents.

ℹ Keep moisture from penetrating into the device. Do not spray the cleaning agent directly onto the screen surface.

ℹ Do not use sharp objects for cleaning.

2.5.2 Operating elements on the device

Switching a device on or off

The state of operation of the device is defined by the switching on and off of the mains voltage.

- Switch on the mains supply on the device.
  The operating system and KNX application (Autostart) are started.
- Switch off the mains voltage supply on the device.
  The operating system shuts down the device.
  The device switches off.

ⓘ Data that was not saved beforehand could be lost (e.g. data of the datalogger).

Carrying out a reset

If the device can no longer be operated, e.g. after a program error, it can be reset. A complete reset is executed here i.e. all data not permanently saved is lost.

- Press push-button (3) or (9) once.
  The device is reset and switches off. In consequence, the operating system and the application are started again automatically after approx. 1 minute. Then the Smart Panel can be operated as normal.

ⓘ Data that was not saved beforehand could be lost (e.g. data of the datalogger).

2.5.3 Operation of the operating system

Operating system and KNX application

The KNX Smart Panel 5.1 (article no. SP5.1KNX) works with the Embedded-Linux Poky/Yocto operating system. All the components required for the device function are preinstalled.

The KNX device application starts automatically after switching on the device (booting process).

ⓘ The KNX Smart Panel is capable of communicating with storage devices (USB stick). Possible file systems here are FAT (up to 4 GB), FAT32 and NTFS (up to v3.1). exFAT is not supported.

ⓘ File names should consist of the following characters of the ASCII encoding only:

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789_-

When other characters are used, problems could arise when changing systems. Furthermore, file names must not contain any spaces, special characters, Cyrillic characters or umlauts.

3 Technical data

General

Mark of approval	KNX / EIB / VDE
Storage/transport temperature	-10 ... +70 °C
Ambient temperature	0 ... +40 °C
Relative humidity	15 ... 85 % (No moisture condensation)
Protection class	II
Dimensions W×H×D	approx. 220x140x48 mm (without design frame)
Dimensions screen W×H	approx. 115 x 86,5 mm

Mains voltage supply

Rated voltage	AC 230 V ~
Mains frequency	50 / 60 Hz
Current consumption	max. 100 mA
Fine-wire fuse	Littelfuse/Wickmann 372 1160 T 1.6 L 250
Power consumption	max. 11.5 W
Power consumption type	4.5 W (40% brightness)
Power consumption	approx. 2.5 W (Display off)

KNX/EIB

KNX medium	TP
Commissioning mode	S-mode
Rated voltage KNX	DC 21 ... 32 V SELV
Power consumption KNX	typical 150 mW
Connection mode KNX	Standard terminal

System

Processor type	Freescale ARM® Cortex™ A9 i.MX6 DualLite
Clock speed	1.0 GHz
L2 cache	512 kB
Mass storage	4 GB eMMC
RAM	1 GB RAM
Audio controller	Freescale SGTL5000

Display

Type	TFT 14.5 cm [5.7"] VGA
Resolution	640×480 pixels
Number of colours	262,000
Observation angle horizontal	± 70 °
Observation angle vertical	± 60 °
Touchscreen	resistive

USB connection

USB version	1.1/2.0
Connection	1× type A

Ethernet connection

Type	10/100/1000 MBit/s Ethernet
Connection	RJ45-socket 8/4-pin

4 Software description

4.1 Software specification

ETS search paths:	Display / LCD displays / Smart Panel 5.1
Configuration:	S-mode with plug-in

Application program:

No.	Short description	Name	Version	from mask version
1	KNX display and operating panel with coloured touch display.	Smart Panel 501611	1.1	701

4.2 Software "501611"

4.2.1 Scope of functions

Scope of functions

- The device is used to control building functions and to display building statuses of various features of a KNX installation.

- Uniform screen layout by the use of predefined display pages available in the configuration software via a template library. This ensures fast and customer-friendly project design and commissioning of the device.

- Freely programmable screen pages according to customer needs. Coloured images, in BMP JPG, PNG and SVG format, can then be included as wallpapers to aid desktop design, and can also be used as icons.

- Within the framework of the freely controllable screen pages, the project engineer has up to 10 master pages and up to 50 pages at their disposal. One master page can be assigned to each page. Functions or backgrounds are thus configured once on the master page and executed or displayed on several pages. A total of 400 elements can be assigned to the master pages and pages.

- The display elements can be configured to the Switching, Dimming, Venetian blind, Value display with different variables, Scene control, Date and Time functions. In addition to the data and time setting, it is possible to specify the corresponding time zone as well as the automatic summer time and winter time changeover. Furthermore, text display, datalogger display, restraint, operating mode switch of a heating/cooling system, collective feedback or load type of a dimmer actuator can be configured.

- The device possesses an Ethernet interface. Various embedded IP protocols allow event-driven email messages to be sent by the KNX application.
  The Ethernet interface also permits user-orientated configuration and commissioning of the device.

- Up to 4 password levels allow controlled access to different display pages and functions. It is possible here to assign one password level each to the screen pages. The signalling system and commissioning function can be protected against unauthorized access by its own password.

- A weekly timer with up to 64 channels and a total of 128 switching times is available. The individual channels can be used for different functions (switching, values, light scenes, operating mode switching). A random and an astro function can be activated optionally on each timer switch channel. The switching times are programmed in the configuration software or directly on the device after commissioning.

- Up 24 light scenes with a total of 32 actuator groups can be created. The light scenes are set directly on the device after commissioning.

- There are up to 80 logical links available, each with up to 8 inputs, up to 12 multiplexers each with up to three channels and 40 timers with ON delay and OFF delay and a filter function.

- Up to 50 different fault messages can be used. Of these fault messages, up to 20 can be active simultaneously. Activation, acknowledgement and deactivation of fault messages can be logged in a message list.

- A presence simulation allows the recording or playing back of any simulations over specific periods of time.

- A datalogger provides the option of recording data received from the KNX in various formats, and displaying it on the device. The data recorded by the datalogger can also be forwarded by e-mail.

- If necessary, a signalling system can provide a security-orientated system to monitor doors and windows. Up to two different signalling areas (internal / external) can be armed and monitored for break-ins and sabotage. Thus visual and acoustic alarming is possible using additional KNX components (e.g. switching actuators) in conjunction with alarm encoders (flash light, internal siren).

- The project design takes place with configuration software independent of the ETS. Commissioning is possible via the ethernet interface or via memory access (USB memory stick).

- An ETS product database that has an embedded plug-in is available for calibrating the configuration data of the ETS project (group addresses, visible communication objects). Group addresses and communication objects can be exchanged between an ETS project and a project of the configuration software with the aid of the plug-in.

4.2.2 Notes on software

Project design and commissioning

The ETS application program described in this documentation with the number "...501611" is used in conjunction with the configuration software to configure and commission the device with the Jung article no. SP 5 KNX (Smart Panel 5.1).

The above-mentioned application cannot be programmed into other devices (e.g. KNX Smart Panel 9.1, Facility Colour Touch Panel IP with Ethernet interface - FP 701 CT IP / Facility Colour Touch Panel - FP 701 CT). There are different application programs available for this purpose.

ℹ The KNX Smart Panel 5.1 is capable of communicating with storage devices (USB stick). Possible file systems here are FAT (up to 4 GB), FAT32 and NTFS (up to v3.1). exFAT is not supported.

ℹ File names should consist of the following characters of the ASCII encoding only:

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789_-

When other characters are used, problems could arise when changing systems. Furthermore, file names must not contain any spaces, special characters, Cyrillic characters or umlauts.

4.2.3 Object table

Number of communication objects:	max. 2,000 Generated dynamically
Number of addresses (max):	3,000
Number of assignments (max):	3,000
Dynamic table management	no

ℹ The communication objects are generated dynamically by the configuration software according to requirements. The available object resources of the device define the number of configurable objects. The resources can be reduced depending on the configured functions and data formats thus used. The device has the following object resources in the unconfigured state...
1-bit (Switching): 800
2-bit (Restraint): 50
4-bit (Relative dimming): 300
1-byte (Value): 300
2-byte (Value): 200
3-byte (Date, Time): 50
4-byte (Value): 200
14-byte (Text): 100

ℹ Within the ETS (Project view), all configured objects are each displayed independently with allocated group addresses after a data comparison (see page 48) depending on the data format. Dynamic objects of the visualisation are displayed without identification of the function affiliation, i.e. objects are not identified with the display texts of the functions (e.g. the object name "switching object" or "dimming object"). For predefined functions (e.g. signalling system or presence simulation) the objects are labelled by function affiliation (e.g. object name "ready to arm internal [Signalling system input]" or "Playback Start/Stop [presence simulation]").
Group addresses may only be linked with communication objects in the configuration software! The data management in the ETS project is only for maintaining the address table (specification of the data formats) and for generating filter tables for backbone/line couplers.

ℹ The communication objects for display and operating functions of the visualisation are dependent on the corresponding configured KNX function. This documentation describes these objects in detail and function specifically in the chapters of the predefined display and operating functions (see page 56).

Object for display illumination

Function: Display illumination

Object	Function	Name	Type	DPT	Flag
☐←	1-bit object	Display illumination	1-bit	1.001	C, W

Description	1 bit object, using which the display background lighting can be switched off and on. Telegram polarity configurable. After a time interval set in the configuration software has elapsed, the lighting automatically switches back to the basic level of brightness.

Objects of the system clock

Function: Time

Object	Function	Name	Type	DPT	Flag
☐↤	3-byte object	Time object	3 byte	10.001	C, W, T

Description 3 byte object with which the device can send the internal time to the bus cyclically or on request.

Function: Date

Object	Function	Name	Type	DPT	Flag
☐↤	3-byte object	Date object	3 byte	11.001	C, W, T

Description 3 byte object with which the device can send the internal date to the bus cyclically or on request.

Function: Date / time request by external device

Object	Function	Name	Type	DPT	Flag
☐↤	1-bit object	Request date / time by external device	1-bit	1.001	C, W

Description 1 bit object, using which the device can receive a request telegram from another KNX subscriber (depending on parameters). The device responds to an external poll by transmitting the data and/or time telegram via the "Date object" and "Time object" objects. You can use the configuration software to configure which of these telegrams is sent. The telegram polarity of the external poll telegram can be configured.

Function: Master clock date

Object	Function	Name	Type	DPT	Flag
☐↤	3-byte object	Master date	3 byte	11.001	C, W, T

Description 3 byte object, with which the device can receive the current date from a KNX master clock for synchronisation (parameter-dependent).

Function: Master clock time

Object	Function	Name	Type	DPT	Flag
☐↤	3-byte object	Master time	3 byte	10.001	C, W, T

Description 3 byte object, with which the device can receive the current time from a KNX master clock for synchronisation (parameter-dependent).

Function: Master clock date / time request

Object	Function	Name	Type	DPT	Flag
☐⇤	1-bit object	Request date / time	1-bit	1.001	C, T

Description 1 bit object, using which a request telegram for the data and time on the KNX can be transmitted (depending on parameters). In this way, the device can poll the date and current time from another bus subscriber, e.g. Master clock. The response of the master is then expected via the objects "MasterDate" and "MasterTime".
The request is made after a restart and then every night at 4.00 am. The telegram polarity can be configured.

Objects for external open pages

Function: Open page

Object	Function	Name	Type	DPT	Flag
☐⇤	1-bit object	Open page [open page external]	1-bit	1.001	C, W, T

Description 1-bit object with which display pages can be recalled directly. An opened page immediately appears on the device display. Each display page has its own object that can be enabled in the configuration software if required.

Object for disabling function of the device

Function: Device disabling function

Object	Function	Name	Type	DPT	Flag
☐⇤	1-bit object	Disabling object of devices [disable device]	1-bit	1.001	C, W, T

Description 1-bit object for activation and deactivation of the device disabling function (polarity configurable). A disabled device displays a disabling logo on the screen (optional) and can execute a special disabling function if required. All other display and operating functions are then out of operation.

Objects for the datalogger

Function: Datalogger

Object	Function	Name	Type	DPT	Flag
□←	1/2/4-byte object	Recording object [Datalogger channel]	1 byte 2 byte 4 byte	5.001... 5.004 5.010 6.010 7.001 8.001 9.001... 9.021 12.001 13.001 14.000 ... 14.079	C, W, T

Description Object with settable type, whose value is recorded by the device at settable times and which can be displayed in a display element as a datalogger channel as a diagram on the screen.

Objects for the logic gate

Function: Logic gate inputs

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Input object [logic gate]	1-bit	1.001	C, W

Description 1 bit objects, which can be logically linked to each other. Each input object of a logic gate can be processed either normally or inverted.

Function: Logic gates

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Start object [logic gates]	1-bit	1.001	C, W, T

Description 1 bit object, which outputs the result of the logical link. The type of link (AND, OR, EXCLUSIVE OR, AND with return), the behaviour (normal or inverted) and the transmit criterion (transmit on any input event or send on changing the output) can be set.

Function: Logic gates

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Disabling object [Logic gate]	1-bit	1.001	C, W

Description 1-bit object for disabling or enabling the gate output (polarity configurable).

Objects for the demultiplexer

Function: Demultiplexer

Object	Function	Name	Type	DPT	Flag
□↤	1/4-bit object, 1/2/4-byte object	Input object [Demultiplexer]	1-bit 4-bit 1 byte 2 byte 4 byte	1.001… 1.008 3.007 5.001... 5.004 5.010 6.010 7.001 8.001 9.001... 9.021 12.001 13.001 14.000 ... 14.079	C, W

Description: Object with adjustable type, who value is forwarded to one of two or four output objects according to one or control objects.

Function: Demultiplexer

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Control object 1/2 [Demultiplexer]	1-bit	1.001	C, W

Description: 1 bit object which specifies to which output object the value of the corresponding input object is forwarded.
Two control objects may be visible, depending on the configured function (1 to 2 demultiplexers or 1 to 4 demultiplexers).

Function: Demultiplexer

Object	Function	Name	Type	DPT	Flag
□↤	1/4-bit object, 1/2/4-byte object	Start object 1/2/3/4 [Demultiplexer]	1-bit 4-bit 1 byte 2 byte 4 byte	1.001… 1.008 3.007 5.001... 5.004 5.010 6.010 7.001 8.001 9.001... 9.021 12.001 13.001 14.000 ... 14.079	C, T

Description: One of two or one of four output objects receiving the value of the input object.

Function: Demultiplexer

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Disabling object [Demultiplexer]	1-bit	1.001	C, W

Description 1-bit object which specifies whether the value of the active output object of the demultiplexer can be transmitted (polarity configurable).

Objects for the timers

Function: Timer

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Input object [Timer]	1-bit	1.001	C, W

Description 1 bit object, whose value is forwarded to the output object of the timer, depending on the value of the appropriate disabling object, the set filter function and the defined delays.

Function: Timer

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Start object [Timer]	1-bit	1.001	C, T

Description 1 bit object which forwards the logical switching state of the timer output.

Function: Timer

Object	Function	Name	Type	DPT	Flag
□↤	Timer	Disabling object [timer]	1-bit	1.001	C, W

Description 1-bit object which specifies whether the value of the corresponding input object is forwarded to the output object (polarity configurable).

Objects for the limiting values

Function: Limiting value

Object	Function	Name	Type	DPT	Flag
□←	1/2/4-byte object	Value object [limiting value input]	1 byte 2 byte 4 byte	5.001... 5.004 5.010 6.010 7.001 8.001 9.001... 9.021 12.001 13.001 14.000 ... 14.079	C, W

Description: Object with adjustable type for transferring the input value to a limiting value module. The value received via this object is compared continuously with the configured limiting values. The limiting value modules have one value input object each.

Function: Limiting value

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Upper limiting value [limiting value output]	1-bit	1.001	C, T

Description: 1-bit object for monitoring the upper limiting value. If the upper limiting value is exceeded or fallen short of (minus hysteresis), the configured switching telegram is transmitted via this object.

Function: Limiting value

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Lower limiting value [limiting value output]	1-bit	1.001	C, T

Description: 1-bit object for monitoring the lower limiting value. If the lower limiting value is fallen short of or exceeded (plus hysteresis), the configured switching telegram is transmitted via this object.

Objects for status timer

Function: Timer switching channel

Object	Function	Name	Type	DPT	Flag
□←|	1-bit object	Switching	1-bit	1.001	C, W, T

Description 1-bit object for outputting switching telegrams of a switching channel of the type "Switching".

Function: Timer switching channel

Object	Function	Name	Type	DPT	Flag
□←|	1-bit object	Comfort object [timer]	1-bit	---	C, W, T

Description 1-bit object for outputting telegrams for switching over to the "Comfort" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

Function: Timer switching channel

Object	Function	Name	Type	DPT	Flag
□←|	1-bit object	Standby object [timer]	1-bit	---	C, W, T

Description 1-bit object for outputting telegrams for switching over to the "Standby" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

Function: Timer switching channel

Object	Function	Name	Type	DPT	Flag
□←|	1-bit object	Night reduction object [Timer]	1-bit	---	C, W, T

Description 1-bit object for outputting telegrams for switching over to the "Night" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

Function: Timer switching channel

Object	Function	Name	Type	DPT	Flag
□←|	1-bit object	Frost/heat protection object [Timer]	1-bit	---	C, W, T

Description 1-bit object for outputting telegrams for switching over to the "Frost/heat protection" operating mode (control of a room temperature controller) of a switching channel of the type "operating mode switch 4 x 1-bit".

Function: Timer switching channel

Object	Function	Name	Type	DPT	Flag
□↤	1-byte object	Operating mode [Timer]	1 byte	20.102	C, W, T

Description 1-byte object for outputting telegrams for KNX operating mode switchover (control of a room temperature controller) of a switching channel of the type "operating mode switch KNX".

Function: Timer switching channel

Object	Function	Name	Type	DPT	Flag
□↤	1/2/4-byte object	Value object [Timer]	1 byte 2 byte 4 byte	5.001... 5.004 5.010 6.010 7.001 8.001 9.001... 9.021 12.001 13.001 14.000 ... 14.079	C, W, T

Description Object with adjustable type for outputting value telegrams of a switching channel of the type "Value".

Objects for the event mails

Function: Event e-mail

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Send e-mail [E-Mail]	1-bit	1.001	C, W

Description 1-bit object for transmission of an event email. If a telegram with the configured polarity is received via this object, the device transmits a preconfigured event email. A separate object is available for each event email.

Objects for the signalling system

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐↤	1-bit object	Detector [signalling system input]	1-bit	1.001	C, W, T

Description: 1 bit object as detector input. There is exactly one detector object for each created detector input for the internal and external skin security areas. The group address of exactly one KNX detector is linked to this object. The telegram polarity of the detector telegram can be configured.
The signalling system cyclically tests the function of a KNX detector, by the system transmitting a value read telegram to the bus via the detector object. The KNX detector (e.g. the channel of a button interface of a binary input) must answer the read telegram of the signalling system with a value answer telegram. For this, the "Read" flag must be set on the communication object of the KNX detector.

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐↤	1-bit object	Internally armed, external skin monitoring [signalling system input]	1-bit	1.001	C, W

Description: 1 bit object to arm and unarm the external skin monitoring (internally armed).
0 = Unarm / 1 = Arm

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐↤	1-bit object	Externally armed, internal and external skin monitoring [signalling system input]	1-bit	1.001	C, W

Description: 1 bit object to arm and unarm the internal and external skin monitoring (externally armed).
0 = Unarm / 1 = Arm

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐↤	1-bit object	Sabotage [signalling system input]	1-bit	1.001	C, W

Description: 1 bit object as a sabotage of the signalling system. The sabotage detector can be connected to this object.
0 = No sabotage, detector inactive / 1 = Sabotage, detector active

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Ready to arm, internal [signalling system output]	1-bit	1.001	C, T

Description: 1 bit object to signal that the signalling system is internally ready to arm. The system is only internally ready to arm when none of the detectors allocated to the external skin is active and there is no fault.
0 = Not ready to arm / 1 = Ready to arm

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Ready to arm, external [signalling system output]	1-bit	1.001	C, T

Description: 1 bit object to signal that the signalling system is externally ready to arm. The system is only externally ready to arm when none of the detectors allocated to the internal skin and the external skin is active and there is no fault.
0 = Not ready to arm / 1 = Ready to arm

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Arming message, internal [signalling system output]	1-bit	1.001	C, T

Description: 1 bit object for static signalling that the signalling system has successfully armed internally, i.e. the external skin monitoring is active.
0 = External skin monitoring not armed / 1 = External skin monitoring armed

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Arming message, external [signalling system output]	1-bit	1.001	C, T

Description: 1 bit object for static signalling that the signalling system has successfully armed externally, i.e. the internal ad external skin monitoring is active.
0 = Internal/external skin monitoring not armed / 1 = Internal/external skin monitoring armed

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Alarm [signalling system output]	1-bit	1.001	C, T

Description: 1 bit object to signal a break-in or sabotage alarm.
0 = No alarm / 1 = Alarm

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐⇤	1-bit object	Fault [signalling system output]	1-bit	1.001	C, T

Description

1 bit object for signalling a fault within the signalling system (missing detector, active sabotage input).
0 = No fault / 1 = Fault.

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐⇤	1-bit object	Optical signal encoder [signalling system output]	1-bit	1.001	C, T

Description

1 bit object to control an optical alarm, e.g. flashlight. If there is an alarm (only with external arming), signalling is carried out via this alarm output. In addition, with external arming, an acknowledgement can be given by the optical alarm encoder (parameter-dependent).
0 = No alarm, flashlight off / 1 = Alarm, flashlight on

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐⇤	1-bit object	Internal siren [signalling system input]	1-bit	1.001	C, T

Description

1 bit object to control an acoustic alarm, e.g. internal siren. If there is an alarm (internal or external arming), signalling is carried out via this alarm output. If there is an alarm, control of this alarm output is restricted to a certain period of time. This switching time can be configured in the configuration software.
0 = No alarm, internal siren off / 1 = Alarm, internal siren on

---

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
☐⇤	1-bit object	Arming acknowledgement [Signalling system output]	1-bit	1.001	C, T

Description

1 bit object to signal that the signalling system was armed internally or externally. The object is dynamic, meaning that it is only "1" for the arming acknowledgment time specified in the configuration software. In the unarmed state or if the arming acknowledgment time has elapsed, the object value is "0".
For example, appropriate pulse disabling elements can be connected to this signal output.

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Unarming acknowledgement [signalling system output]	1-bit	1.001	C, T

Description

1 bit object to signal that the signalling system was unarmed internally or externally. The object is dynamic, meaning that it is only "1" for the unarming acknowledgment time specified in the configuration software. In the armed state or if the unarming acknowledgment time has elapsed, the object value is "0".
For example, appropriate pulse disabling elements can be connected to this signal output.

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Alarm detector text [signalling system output]	14 byte	16.001	C, T

Description

14 byte object to transfer a 14 character detector text to the bus. If there is an alarm, the signalling system sends the signal text of the detector triggering the alarm to the bus via this object. The detector text can be configured separately for each detector in the configuration software.

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Detector text fault [signalling system output]	14 byte	16.001	C, T

Description

14 byte object to transfer a 14 character detector text to the bus. If there is an alarm, the signalling system sends the signal text of the detector which caused the fault (missing detector) to the bus via this object. The detector text can be configured separately for each detector in the configuration software.

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□←	1-bit object	Prealarm signalling, internal [signalling system output]	1-bit	1.001	C, T

Description

1 bit object to signal an elapsing prealarm with internal arming. In the case of a previously detected break-in or sabotage alarm, this signal output is active "1" for the length of the alarm delay time configured in the configuration software. Otherwise the object value is "0".

Function: Signalling system

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Prealarm signalling, external [signalling system output]	1-bit	1.001	C, T

Description: 1 bit object to signal an elapsing prealarm with external arming. In the case of a previously detected break-in or sabotage alarm, this signal output is active "1" for the length of the alarm delay time configured in the configuration software. Otherwise the object value is "0".

Objects for the fault message function

Function: Fault message

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Fault signal object	1-bit	1.001	C, W

Description: 1-bit object for the reception of a fault message (polarity configurable). Each fault message has its own object.

Function: Fault message

Object	Function	Name	Type	DPT	Flag
□↤	14-byte object	ASCII text object	14 byte	16.001 ... 16.002	C, W, T

Description: 14 byte object to display a variable message text with a fault message activated. Each fault message has its own object.

Function: Fault message

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Acknowledgement object	1-bit	1.001	C, T

Description: 1-bit object to confirm a received fault message (polarity configurable). Each fault message has its own object.

Function: Fault message

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Acknowledgement reception object	1-bit	1.001	C, W

Description: 1-bit object that can receive confirmations from other devices (polarity configurable). Each fault message has its own object.

Objects for scene function

Function: Scene function

Object	Function	Name	Type	DPT	Flag
□↤	1-byte object	Extension object [light scenes]	1 byte	18.001	C, W

Description 1 byte object for opening or saving light scenes.

Function: Scene function

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object, 1/2-byte object	Light scene object [light scenes]	1-bit 1 byte 2 byte	1.001 5.001... 5.004 9.001... 9.021	C, W, T

Description Object with settable type for controlling the actuator group contained in a scene function.

Objects for the presence simulation

Function: Presence simulation

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Playback active [presence simulation]	1-bit	1.001	C, T

Description 1 bit object, which displays that a presence simulation is being played.
0 = Presence simulation not being played / 1 = Presence simulation being played.

Function: Presence simulation

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Recording active [presence simulation]	1-bit	1.001	C, T

Description 1 bit object, which displays that a presence simulation is being recorded.
0 = Presence simulation not being recorded / 1 = Presence simulation being recorded.

Function: Presence simulation

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object	Recording Start/Stop [presence simulation]	1-bit	1.001	C, W

Description 1 bit object, with which the playback of a presence situation can be started and stopped.
0 = Stop presence simulation / 1 = Start presence simulation.

Function: Presence simulation

Object	Function	Name	Type	DPT	Flag
□↤	1-bit object, 1-byte object	Recording object [presence simulation]	1-bit 1 byte	1.001 5.001... 5.004	C, W, T

Description Object with adjustable type (1 bit or 1 byte), whose received telegram values can be saved by time by the device during a recording. The recorded telegrams can later be transmitted when playing back on the bus.

4.2.4 Functional description

Introduction

The device is used primarily to display statuses within a KNX installation and to control system functions. The display elements are shown on a colour TFT monitor at a resolution of 640 x 480 pixels (14.5 cm [5.7"], 4:3). The elements are controlled by touching the TFT monitor (touch screen).

The device displays all KNX functions clearly and concisely. By touching it is possible to execute functions such as switching, dimming and Venetian blind control, to save and recall light scenes as well as visualize and evaluate complex functions such as value transmitter, date and limiting values.
A clear and comprehensible menu navigation ensures fast access to the desired functions. The use of predefined display pages available in the configuration software via a template library makes it possible to project design and commission the device in a uniform layout quickly and in a customer-friendly way.
In addition to the predefined display interfaces, freely programmable screen pages can also be used according to customer requirements. Coloured images, in BMP JPG, PNG and SVG format, can then be included as wallpapers to aid desktop design, and can also be used as icons

4.2.4.1 Available device resources

Object resources

The number of configurable device functions depends on the communication objects available. The communication objects are generated dynamically by the configuration software according to requirements. The resources can be reduced depending on the configured functions and data formats thus used. The device has the following object resources in the unconfigured state...

Object type	Number of available objects
1-bit (Switching)	800
2-bit (Restraint)	50
4-bit (Relative dimming)	300
1-byte (value)	300
2-byte (value)	200
3-byte (Date, Time)	50
4-byte (value)	200
14-byte (Text)	100
Total:	**2,000**

Available object resources dependent on the object types

The device provides a max. of 3,000 connections between objects and group addresses.

Function resources

The following resources are available for the individual functions of the device...

- Display and operating functions: Max. 50 rooms, max. 240 KNX functions max. 10 function units

- Internal open pages: max. 100
- Scene recalls: max. 40
- Signalling system: max. 40 detectors (internal and external skin together)
- Datalogger: max. 20 datalogger channels
- Logic gates: max. 80 gates with up to 8 inputs and one output each
- Timers: max. 40
- Limiting value modules: max. 40
- Demultiplexer "1 to 2" and "1 to 4": max. of 7 each
- System time: Max. 40
- Timer: max 64 switching channels with a total of 128 switching times
- Scenes: max. of 24 scenes, max. of 32 scene functions
- Presence simulation: max. 8 simulations, max. 32 functions (15 functions per simulation)
- Fault messages: max. 50
- Event e-mails: max. 50
- Free project design, master pages: Max. 10
- Free project design, pages: Max. 50
- Free project design, elements: Max. 400

ⓘ During commissioning, designed data is transferred to the device in the original file size and stored in the device memory. To avoid having to commit large amounts of storage resources for these elements, the size of the icons and images should be adapted to the display size of the screen in the display elements.

4.2.4.2 Configuration software

4.2.4.2.1 Introduction, installation and program start

Introduction

The Smart Panel 5.1 is configured and commissioned via the "JUNG GUI Designer" of Version 3.0 or higher. This configuration software is installed independent of the ETS and allows the graphic configuration of display and operating elements and the configuration of the communication objects and function parameters to be simple and clear.
An ETS product database that has an embedded plug-in is available for calibrating the configuration data of the ETS project (group addresses, visible communication objects). The data exchange between configuration software and ETS plug-in can take place quickly and easily at the push of a button via programming interfaces that any commissioning PC has by default.
The separate configuration software and the resulting separation from ETS make it possible for the Smart Panel 5.1 to be configured and commissioned platform-independently to a large extent.

Installation and program start

The configuration software is an executable EXE program that must be installed on the PC before using for the first time. For this reason, the program is supplied as installation package. Executing the installation package opens the Setup program, which provides an easy guide through the installation process and installs the configuration software correctly on the PC.

ℹ The configuration software can be run on PCs with the operating systems Windows Vista, 7 and 8.

The configuration software can be opened after a successful installation operation. Opening is possible - depending on the options selected or possible during installation - either by double-clicking the program icon on the desktop or, alternatively, via the Start menu or the Quick Start bar of the operating system.

After starting the configuration software, a new project is first opened. This project can be used as the basis for a new configuration if no project file is yet available. Alternatively, an existing project file such as a document can be opened in a word processer, in which an existing device configuration for commissioning can be programmed in a device or a previously started project design can be continued.
In the configuration software, a project file can be created or opened and saved in the "File" menu. A separate project file is required for each individual project design of a device. For this reason, when assigning a name to the project file (file ending: "*.jpct5"), a meaningful name should be selected to identify the configured device (e.g. "living room panel.jpct5"). The filename is assigned on saving.

4.2.4.2.2 Structure and operation

Structure

The program interface is subdivided into different areas (figure 4), in which the project design of the device can be structured. Structure trees in the project bar (A) and in the structure view (B) make it easier to navigate through the functions, device settings and display pages. Display pages can be set up quickly and customer-friendly as well as freely according to individual criteria by using a template library with building structures and KNX functions in the templates bar (C). A large work area (D) allows the set project design to be previewed and simulated. Parameters of functions or graphic display elements are available clearly in property lists (E) or on special display pages in the work area. All program functions (file operations, ETS synchronisation, commissioning) can be retrieved and executed via the menu bar (F). Many configuration processes - for example, the creation of new rooms and KNX functions - can be executed with the mouse by drag & drop.

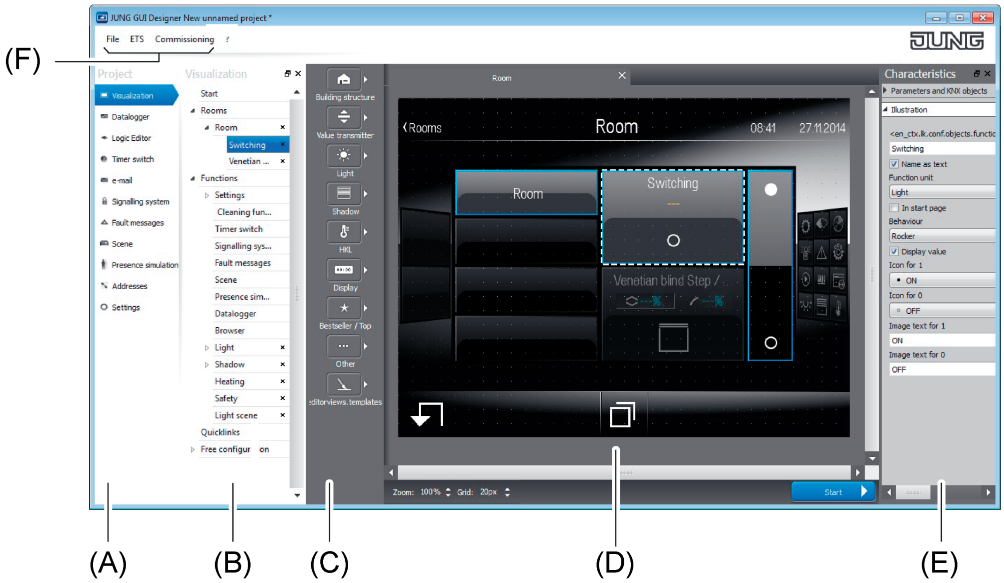


Figure 4: Structure of the program interface (standard structure)

(A) Project bar
(B) Structure view (position modifiable)
(C) Templates bar
(D) Work area
(E) Characteristics bar (position modifiable)
(F) Menu bar

The areas of the program interface perform the following tasks...

- Project bar:
  The project design of the device is accessed and the visible project area defined via the project bar. What you select here determines which project contents are displayed in other areas of the program. The project design of all operating and display information of the graphic user interface is possible via the "Visualisation" node. The device settings are available via the "Settings" node. The internal and external KNX group addresses are created and managed via the "Addresses" node.
  The project bar is always fixed to the left edge of the program window.

- Structure view:
  The structure of the project design is shown in the structure view. Depending on the selection in the project bar, it is possible to navigate through all available project settings or function elements here. In the project area of the visualisation, the project structure of the available display pages, for example, is displayed in the structure view (building and function unit pages, system pages). Therefore, rooms, function units and KNX functions are created and configured here. In other project areas, a systematic overview of settings or function elements is possible by means of the structure view (e.g. timer channels of the timer or configured fault messages).
  The structure view in the standard view is arranged next to the project bar to the right. It can be detached from the program window and positioned anywhere on the PC screen or on another place in the window if required. Optionally, the structure view of the selected program area can be closed ("X" in the header) so that it is hidden. A structure view can be restored if the entry of the structure view in the menu line (F) is selected again by clicking with the right mouse button.
  Several structure views can be displayed in a project area for cross-functional project design. If this is desired (e.g. displaying structure of the datalogger in the visualisation), the necessary structure view of other project areas (here: datalogger) must be clicked on in the header of the visible structure view (here: Visualisation) by a right mouse click. In this way, the structure views of all other or selected project areas can be made visible simultaneously.
  Not all the nodes in the project bar require a structure view. The structure view is only available for project areas that require the systematic overview of settings or navigation through configuration elements.

- Templates bar:
  In the templates bar, which is only visible in the project area of the visualisation, is the templates library for the project design of the desired building and function unit structure and KNX functions. The templates for the project structure are assigned by drag & drop: Elements of the templates library are assigned to the structure view or directly to the designated positions in the work area (see page 45).

- Work area:
  The work area displays various types of information depending on which project area was selected via the project bar.
  The work area is used as a preview of the configured graphic user interface in the project area of the visualisation. It displays the corresponding display pages of the elements selected in the structure view. In this way, the appearance of the control surfaces (buttons, rockers, value sliders), display areas (status texts and status symbols) and navigation elements can be visualized page by page and adjusted accordingly to the requirements. The rooms, function units, KNX functions and function pages visible in the display area are selected by mouse click whereby the characteristics of the selected elements are displayed directly in other program areas. In this way, quick and easy navigation is possible through the building structure, display and operating functions and settings during the project design.
  In the display area of the visualisation a simulation of the graphic user interface can be executed. This makes it possible to already test and visualize all operating and display functions during the project design including real navigation through the display pages. The user interface in the simulation can be used in the same way as on the device after commissioning. Unlike local control, however, no KNX telegrams can be transmitted or evaluated. Even some functions whose statuses are controlled by bus telegrams (e.g. the signalling system or fault messages) can only be operated to a limited extent in the simulation. The simulation is started by pressing the control surface "Start" in the footer of the work area. The simulation is stopped at the current position by clicking the mouse button on the control surface "Stop". All other program areas of the configuration software are hidden during a simulation.
  In other project areas, the work area displays parameters for functions or function elements (e.g. timer channels of the timer or configured fault messages).
  The work area is always arranged in the centre of the program window. Its size varies depending on the visibility of other program areas. The display area fills the entire program window in the simulation.

- Characteristics bar:
  The characteristics bar, which is only visible in the project area of the visualisation, contains all parameters and communication objects for display pages and operating and display elements of the graphic user interface. The characteristics bar displays all parameters and objects for the selected element depending on the selection in the structure view or in the work area.
  The characteristics bar is subdivided into two areas. The first area always contains all KNX objects and normally parameters that define communication characteristics (e.g. parameters for defining data formats and operating times, password protection settings of display pages). The second area contains parameters that influence the representation of the display and operating elements (e.g. name of display pages, image texts, symbol definitions, assignments to function units, value formats).
  The characteristics bar in the default view is arranged on the right edge of the program window. It can be detached from the program window and positioned anywhere on the PC screen or on another place in the window if required. Optionally, the characteristics bar can be closed ("X" in the header) so that it is hidden. The bar can be restored if the entry of the characteristics in the menu line (F) is selected again by clicking with the right mouse button.

- Menu bar:
  All program functions can be retrieved and executed via the menu bar. This includes file operations, the ETS synchronisation as well as the commissioning by data exchange or IP communication.

Operation

The configuration software has been designed so that many configuration processes can be executed with the mouse by drag & drop. Particularly the configuration of the visualisation - for example the creation of new rooms and KNX functions - is carried out in this simple way.
Newly implemented, and also contained in Version 3.0 of the "JUNG GUI Designer", is the copy, cut and paste function. Rooms, functions, master pages and normal pages of the free project design that have been designed once, as well as their elements, can be duplicated very easily using copy and paste.
Parameters for the different device functions are set similarly to the ETS for the most part: Parameters - depending on the functions to be configured - are either available in list form in the work area or in the area of the settings and divided into categories depending on the functions.

Configuration of the Visualisation
In the templates bar, which is only visible in the project area of the visualisation, is the templates library for the project design of the desired building and function unit structure and KNX functions. The templates for the project structure are assigned by drag & drop: Elements of the templates library are assigned to the structure view or directly to the designated positions in the work area.
The following images show by way of example the creation of a new room and KNX function "Switching" in the standard function unit "Light".
If several rooms are to be designed with the same functions, the first room should be developed completely in order to copy the other rooms from it afterwards using the copy/paste function.

ℹ The example shows the creation of a new building structure and KNX function into the structure view by drag & drop. Alternatively, these elements can also be inserted into the graphic user interface by drag & drop in the work area.

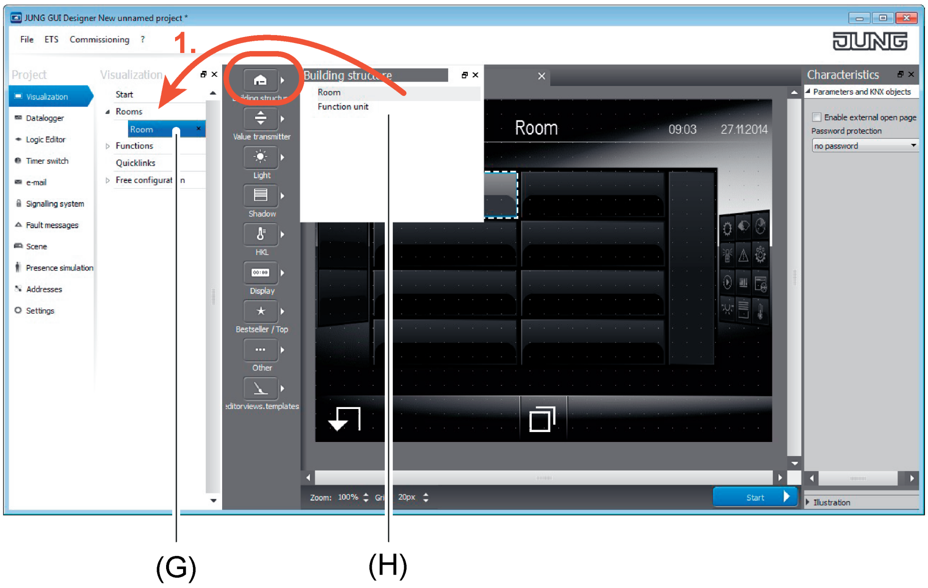

JUNG GUI Designer New unnamed project *
File
ETS
Commissioning
?
1.
Project
Visualization
Datalogger
Logic Editor
Timer switch
e-mail
Signaling system
Fault messages
Scene
Presence simulation
Addresses
Settings
Visualization
Start
Rooms
Room
Functions
Quicklinks
Free configuration
Building structure
Value transmitter
Light
Shadow
HKL
Display
Bestseller / Top
Other
editorviews.templates
Building structure
Room
Function unit
Room
09:03
27.11.2014
Characteristics
Parameters and KNX objects
Enable external open page
Password protection
no password
Zoom: 100%
Grid: 20px
Start
Illustration
(G)
(H)

Figure 5: Creation of the building structure (here: insertion of a room)

(G) New room
(H) Template for building structure

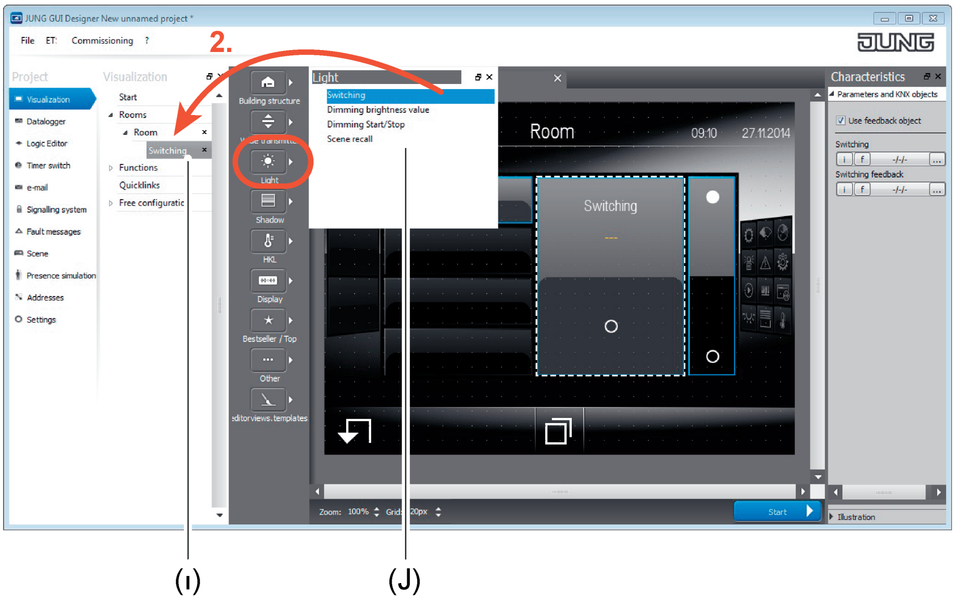

JUNG GUI Designer New unnamed project *
File
ETS
Commissioning
?
2.
Project
Visualization
Datalogger
Logic Editor
Timer switch
e-mail
Signaling system
Fault messages
Scene
Presence simulation
Addresses
Settings
Visualization
Start
Rooms
Room
Switching
Functions
Quicklinks
Free configuration
Building structure
Value transmitter
Light
Shadow
HKL
Display
Bestseller / Top
Other
editorviews.templates
Light
Switching
Dimming brightness value
Dimming Start/Stop
Scene recall
Room
09:10
27.11.2014
Switching
Characteristics
Parameters and KNX objects
Use feedback object
Switching
Switching feedback
Zoom: 100%
Grid: 20px
Start
Illustration
(I)
(J)

Figure 6: Creation of a KNX function (here: insertion of a function "Switching")

(I) New KNX function in a room
(J) Template for KNX functions in standard function unit "Light"

Configuration of the KNX group addresses

Communication objects of the device can only transmit telegrams to the KNX if they have been linked with external KNX group addresses. Furthermore, internal group addresses can be used to link functions of the device together. This is advisable, for instance, if these functions exchange data values or switching states among each other but do not have to transmit telegrams directly to the KNX (e.g. internal linking of logic functions).

The configuration software makes it possible to create and link internal as well as external group addresses. The group addresses can be managed synchronously for an ETS project or independent of that. Normally, an ETS synchronous management of the group addresses is preferable since the device configured with the aid of the configuration software is integrated into a KNX installation and thus in an environment with different group addresses of various tasks and data formats. An ETS product database that has an embedded plug-in is available for calibrating the configuration data of the ETS project (group addresses, visible communication objects). Group addresses and communication objects can be exchanged between an ETS project and a project of the configuration software with the aid of the plug-in. In this way, it easily possible to load the existing group addresses in an ETS project into the device configuration and to use them there.

It is often advisable during the development phase of a project to create new external as well as internal group addresses independent of the ETS. This is possible in the configuration software by selecting the entry "Addresses". Here, all group addresses synchronised with the ETS are displayed as well. Internal and external addresses are identified differently. Internal address are identified by an "i", and external addresses by an "e". This identification is also necessary when creating new addresses in order to distinguish between internal and external addressing. For this purpose, an "i" or "e" must be prefixed when entering the address.

Communication objects can only be linked with group addresses that exist in the address list. A link to an object can be made by the link-editor, which every object has (button "..." next to the communication object).

ℹ The configuration software can display and manage two or three-stage group address structures. The structure to be used must be configured in the device settings. The setting must match the setting for the group address structure of the relevant ETS project!
The ETS4 supports a free structure configuration of the group addresses. The configuration software as well as the plug-in cannot represent this free group address structure and always interpret the group addresses in the specified form (two or three-stage).

4.2.4.2.3 Data comparison with ETS

Introduction

An ETS product database that has an embedded plug-in is available for calibrating the configuration data of the ETS project (group addresses, visible communication objects). Group addresses and communication objects can be exchanged between an ETS project and a project of the configuration software with the aid of the plug-in. In this way, it easily possible on one hand to load the group addresses available in an ETS project into the device configuration and to use it there. On the other hand, addresses that were created in the configuration software can be transferred to the ETS project by the synchronisation process.
The ETS Synchronisation is able to detect conflicts with group addresses. Conflicts will then arise, for example, if group addresses in the configuration software are created independent of the ETS and are linked with objects, these addresses already use other data formats in the ETS projects, however.

Within the ETS (Project view), all configured objects of the device are each displayed independently with allocated group addresses after a data comparison depending on the data format. Dynamic objects of the visualisation are displayed independent of function, i.e. the objects are not identified with unique names. For predefined functions (e.g. signalling system or presence simulation) the affiliated objects are labelled dependent on function.
Group addresses may only be linked with communication objects in the configuration software!
The data management in the ETS project is only for maintaining the address table (specification of the data formats) and for generating filter tables for backbone/line couplers.

ℹ The device is only commissioned by the configuration software. The ETS product database cannot be used to load the application program into the device. The plug-in prevents programming of the application data by the ETS.
The physical address of the device can also be programmed using the application program.

Performing synchronisation

Synchronisation by means of ETS must be performed in a defined order. The steps described below explain the procedure for performing a synchronisation of group addresses and communication objects with an ETS project.

A synchronisation should take place at the beginning of the device configuration when an ETS project with group addresses already exists. During the progress of a project design, it is advisable to perform a synchronisation with the ETS regularly in order to detect group address conflicts at an early stage or to reduce the configuration work as much as possible when creating new group addresses. After completing the device configuration in the configuration software, an ETS synchronisation should always be performed so that all objects and group addresses used are synchronised with the ETS project.

Synchronisation of the device configuration with the ETS requires that a device in the corresponding ETS project was inserted at the designated position of the topology by means of the product database. Ideally, a physical address should have been assigned to the device in the project and programmed.
The ETS and configuration software must be opened with the designated projects.

- Step 1: In the configuration software, recall the entry "Synchronise ETS -> ETS" in the menu.

  A program window will open displaying the standby mode of the ETS synchronisation.
- Step 2: Change to the ETS. In the ETS project, recall the parameter view of the device entry.

  The plug-in is started.
- Step 3: Click on the "Search configuration tool" button.

The plug-in attempts to establish communication with the configuration software. If the connecting process is successful, the plug-in identifies the configuration software, reads out the project design and displays in the left-hand list window the device name and device information of the project design found. If the ETS could already successfully synchronise the project design once, the device name of the selected project design will correspond to the name of the device in the ETS project. The device information then displays the physical address of the device that was configured at the time of the last synchronisation. If the project design has not yet been synchronised with the ETS, a standard device name is displayed and the device information indicates "new".
Next to the list window on the right, the plug-in displays more information in tabular form in the reading area regarding the project design read out and the device entry of the ETS project. By comparing this information it is possible to determine whether the correct project design was selected and when the last synchronisation took place.

ⓘ It is possible to activate several configuration tools in the ETS-Synchronisation. The plug-in always finds all the tools that are in synchronisation state. This is advisable, for instance, if there are different devices in a KNX installation that have to be synchronised in the ETS project with different device entries. In this case, a separate synchronisation process must be performed for each device entry in the ETS project.

ⓘ ETS and configuration software must always be on the same PC. The data exchange between ETS and configuration software takes place in the operating system via IP communication (local host / IPv4: 127.0.0.1). If a firewall is installed on the PC, it must be ensured that communication via local host is not prevented.

- Step 4: Once it is certain that the correct project design and device entry were selected in the ETS project, the synchronisation can be resumed. To do this, click on the project design to be synchronised in the left-hand list window and then click on the "Synchronise" button.

  The plug-in reads more details of the project design and displays them in a new window. In the left window area, the objects and group addresses read out from the device entry of the ETS project are displayed. In the middle area, the window displays the information read out from the project design.

- Step 5: Press the "Compare" button.

  The plug-in compares the project design read out from the configuration software with the ETS project. The comparison result is displayed in the left window area.
  If address conflicts (data formats that do not match each other) were detected, the plug-in highlights these conflicts in colour and displays a warning message. After confirming the warning message, it is possible to save the conflicts in text form by clicking on the "Save conflicts" button. The synchronisation process cannot then be executed until the end. All conflicts must first be removed manually by intervening in the project design. Only then can a new synchronisation process be resumed without interruption.

- Step 6: If no conflicts were detected in group addresses, the "Merge" button can be clicked on to resume the synchronisation.

  The plug-in then harmonises all objects and group addresses and updates the window area as a preview.

- Step 7: Finally, the harmonised project design can be applied in the ETS project and in the project design. To do this, the "Apply" button must be pressed.

  Objects of the project design are added to the ETS project. Group addresses are transferred from the ETS project to the project design and/or from the project design to the ETS project. The plug-in writes the device name, description and physical address from the ETS project as well as the ETS project name in the project of the configuration software so that identification is possible at the beginning of a new synchronisation process (see setup 3).
  The synchronisation is terminated after the transfer process has successfully run without any errors. In the configuration software, the standby mode of the ETS-Synchronisation is then terminated automatically. The plug-in can be closed.

ⓘ Group addresses may only be linked with communication objects in the configuration software (GUI Designer)! Connections created in the ETS are deleted during a synchronisation.

ⓘ If a synchronisation in the plug-in is cancelled before the end, this must also be cancelled manually in the configuration software before a new synchronisation can be executed. The reverse is true in like manner.

4.2.4.2.4 Commissioning

Introduction

The commissioning of the device is possible by IP programming connection via the Ethernet interface or alternatively via memory access (USB memory stick). When performing a commissioning, the project design is transferred from the configuration software to a device. After successful transfer by IP or memory access, the target device re-starts automatically and thereby directly applies the new programmed project design.

Besides the programming of a project design, the readout is possible, too. A readout can be performed for the purpose of reconstruction, for example. Here, an IP connection to the device can be established, the existing project design read out and transferred to the project of the configuration software. Alternatively, it is possible to read out an existing project design in a device by memory access.

Different file formats are used for the project design of the tablet using the configuration software, for commissioning the KNX Smart Panel as well as project data reconstruction of a device already in operation. The different formats and their application are listed in the table below:

File format	Intended use of the file
*.jpct5	Project file: A project for the Smart Panel 5.1 created in the Jung GUI-Designer is saved in this file format. This project file is saved on a data storage medium and can be further processed at any time using the configuration software.
*.jd3ct5	Commissioning file: Data relevant for the commissioning is saved in a jd3ct5 file. This file can be saved on a USB memory stick in order to then execute commissioning by memory access. This file format is used for commissioning the SP5.1KNX!
*.jdct5	Reconstruction file: In this file format the commissioning file of a SP5.1KNX restored via a reconstruction by means of memory access is saved on the USB memory stick. This file can then be loaded via the commissioning menu ("Reconstruction -> File...") of the configuration tool.

Figure 7: File formats for programming the KNX Smart Panel 5.1

ℹ In the Jung GUI Designer, project files exported to a USB memory stick can only be opened via "Commissioning -> Reconstruction -> IP..." (Import project).
Exported project files (*.jdct5) are not displayed in the "Open project" window ("File -> Open")!

ℹ To ensure that commissioning by an IP programming connection is possible, the device must be connected to a network via the Ethernet interface and the KNX application executed in the device. It is not necessary here to recall a specific display page.

ℹ If a firewall is installed on the commissioning PC, this must enable the IP access for the configuration software. Otherwise, an IP programming connection to the device will not be possible. A firewall normally displays blocked programs when these programs are installed or started. Should this be the case when installing or starting the configuration software, be sure to adapt the configuration of the firewall without fail!

ℹ During commissioning by means of IP, the existing devices are searched for in the first step. This broadcast search is performed by UDP (User Datagram Protocol) via port 63151. The programming connection takes place in the next step by TCP/IP (Transmission Control Protocol / Internet Protocol) via port 4242.

ℹ To ensure that commissioning is possible using an IP programming connection, the IP settings in the "Network" submenu of the settings must be configured correctly on the device and on the commissioning PC. This includes the device's own IP address, the sub-network mask, the addresses of the standard gateway (e.g. Internet router) and a valid DNS server as well as settings for an optionally available firewall or proxy server.

Commissioning and reconstruction by IP programming connection or memory access is described in the following sections.

Commissioning by means of IP

The Smart Panel 5.1 can be commissioned with the "JUNG GUI Designer" configuration tool of Version 3.0 or higher. The required runtime is integrated into the commissioning process for devices from this version.

Commissioning by means of IP must be performed in a defined order. The steps described below explain the procedure for performing a commissioning by means of IP.

The configuration software must be opened with the designated project. The device must already be switched on and be ready for operation.

- Step 1: In the configuration software, recall the entry "Commissioning -> Transfer -> IP" in the menu.

  The configuration software first saves the current project. To do this, specify a file name if you have not already done so. The configuration software then searches in the network for available devices by means of IP broadcast. After the search procedure is completed, a window for device selection will open. In this window, devices can be identified using their name, physical address, the IP address and the MAC address.

ℹ The device name displayed in the device selection corresponds to the computer name. It can be suitably adapted directly on the device in the submenu of the "Network" if required. The submenu is in the user and system settings.

ℹ Next to the device selection on the right is a button for updating the view. This allows a new IP broadcast device search procedure to be triggered.

- Step 2: In the device selection list, select the target device to be programmed by a simple mouse click. After that, click on the "Start" button. Alternatively, the list entry of the target device can be selected by a double mouse click.

  The configuration software establishes an IP programming connection to the device and prompts you to enter the password for commissioning by means of IP.

- Step 3: Enter the password for commissioning by means of IP.

  The configuration software loads the project design into the target device. Afterwards, the device re-starts automatically and applies the programmed project design. This completes the commissioning process.

ℹ The configuration software allows the password to be entered incorrectly a maximum of three times. After entering the password incorrectly a fourth time, the configuration software will abort the commissioning operation.

ℹ The password for the commissioning by means of IP is not defined in the configuration software. It is only saved in the device and must also be changed there. Passwords can be customized in the submenu "Settings". It is advisable to activate the password protection for the display page of the passwords so that the setting of new passwords is protected against unauthorised access. This is done by assigning the display page in the configuration software to a password level.

Commissioning by means of memory access

The Smart Panel 5.1 can be commissioned with the "JUNG GUI Designer" configuration tool of Version 3.0 or higher. The required runtime is integrated into the commissioning process for devices from this version.

In the case of commissioning by means of memory access, the project data created in the configuration software and saved in a commissioning file must be imported to the device. This is possible directly on the device in the user and system settings.
Commissioning by means of memory access must be performed in a defined order. The steps described below explain the procedure for performing a commissioning by means of memory access.

The configuration software must be opened with the designated project.

- Step 1: In the configuration software, recall the entry "Commissioning -> Transfer -> File" in the menu.

  The configuration software first saves the current project. To do this, a file name must be specified if you have not already done so. Afterwards, the configuration software prompts for a file name and the storage location for the commissioning file. A commissioning file has the file ending "*.jd3ct5" or "*.jdct5".
  The configuration file is created and saved at the predefined storage location.

- Step 2: On the device; go to the user and system settings and choose the menu item for importing a project design (see page 156). Import the commissioning file saved previously.

  The device imports the project design. It then re-starts automatically. This completes the commissioning process.

Reconstruction by means of IP

A reconstruction by means of IP must be performed in a defined order. The steps described below explain the procedure for performing a reconstruction by means of IP.

ℹ During a reconstruction using the "JUNG GUI Designer" of Version 3.0, the reconstruction files are imported into the configuration tool for the Smart Panel 5.1. On older versions of the Smart Panel, no reconstruction files can be created using this version of the GUI Designer.

The configuration software must be opened. The device must already be switched on and be ready for operation.

- Step 1: In the configuration software, recall the entry "Commissioning -> Reconstruction -> IP" in the menu.

  The configuration software searches in the network for available devices by means of IP broadcast. After the search procedure is completed, a window for device selection will open. In this window, devices can be identified using their name, physical address of the IP address and the MAC address.

ℹ The device name displayed in the device selection corresponds to the computer name. It can be suitably adapted directly on the device in the submenu of the "Network" if required. The submenu is in the user and system settings.

ℹ Next to the device selection on the right is a button for updating the view. This allows a new IP broadcast device search procedure to be triggered.

- Step 2: In the device selection list, select the device to be reconstructed by a simple mouse click. After that, click on the "Start" button. Alternatively, the list entry of the device can be selected by a double mouse click.

  The configuration software establishes an IP connection to the device and prompts you to enter the password for commissioning by means of IP.
- Step 3: Enter the password for commissioning by means of IP.

  The configuration software reads out the project design from the device. After the readout procedure is completed, the configuration software wants to transfer the readout project design to its own project. This means that the previous project design will be overwritten by the readout project design. Consequently, the software will ask whether or not the opened project should be saved. After confirmation, the configuration software will load the readout project design to its own project. The reconstruction process is thus completed.

ℹ The configuration software allows the password to be entered incorrectly a maximum of three times. After entering the password incorrectly a fourth time, the configuration software will abort the commissioning operation.

ℹ The password for the commissioning by means of IP is not defined in the configuration software. It is only saved in the device and must also be changed there. Passwords can be customized in the submenu "Settings". It is advisable to activate the password protection for the display page of the passwords so that the setting of new passwords is protected against unauthorised access. This is done by assigning the display page in the configuration software to a password level.

ℹ During the reconstruction process, the device can be used normally.

Reconstruction by means of memory access

In the case of reconstruction by memory access, the project data exported by the device must be imported to the configuration software. The project design that is active in the device can be exported directly on the device in the user and system settings.
A reconstruction by means of memory access must be performed in a defined order. The steps described below explain the procedure for performing a reconstruction by means of memory access.

ℹ During a reconstruction using the "JUNG GUI Designer" of Version 3.0, the reconstruction files are imported into the configuration tool for the Smart Panel 5.1. On older versions of the Smart Panel, no reconstruction files can be created using this version of the GUI Designer.

The device must already be switched on and be ready for operation.

- Step 1: On the device go to the user and system settings and recall the menu item for exporting a project design (see page 156). Export the project design. The exported file has the file ending "*.jdct5".
- Step 2: In the configuration software, recall the entry "Commissioning -> Reconstruction -> File" in the menu. Specify the storage location of the project file to be imported and select the file.

The configuration software reads out the project design from the file. After the readout procedure is completed, the configuration software wants to transfer the readout project design to its own project. This means that the previous project design will be overwritten by the readout project design. Consequently, the software will ask whether or not the opened project should be saved. After confirmation, the configuration software will load the readout project design to its own project. The reconstruction process is thus completed.

ℹ In the Jung GUI Designer, project files exported to a USB memory stick can only be opened via "Commissioning -> Reconstruction -> IP..." (Import project).
Exported project files (*.jdct5) are not displayed in the "Open project" window ("File -> Open")!

4.2.4.3 Predefined display and operating functions

The device displays all KNX functions clearly and concisely. By touching it is possible to execute functions such as switching, dimming and Venetian blind control, to save and recall light scenes as well as visualize and evaluate complex functions such as value transmitter, date and limiting values. A clear and comprehensible menu navigation ensures fast access to the desired functions.

The use of predefined display pages available in the configuration software via a template library makes it possible to project design and commission the device in a uniform layout quickly and in a customer-friendly way.

4.2.4.3.1 Display structure

Main menu level, rooms and function units

In order to make optimum use of the wide range of operating and display functions, the device has a user interface that is clearly and logically structured according to functions, rooms and favourites. This ensures intuitive handling of the building control system. Operating and display functions (switching, dimming, blind, ...) can be subdivided into different rooms. The individual rooms are recalled via a room page in which the functions of each room can be controlled centrally and efficiently.
In addition, the operating and display functions are also allocated to function units (light, shading, heating, ...). Function units can be recalled via a function page in which room-independent and function-oriented control of the building functions is possible.
The control and display elements on the graphic interface are arranged in a standardized designed so that the display is identical on all display pages and operating steps are simplified considerably.

After starting the KNX application, the display first displays the main menu level. The main menu level contains up to 3 display pages...

- Start page
- Room page
- Function page

From the main menu level, the lower level menus can be accessed by touch operation (room control, function control, system settings).
Provided that no operation takes place anymore in the lower level menus, the display can return time-controlled to the main menu level. In the configuration software it is possible to configure after which time interval and to which page this return takes place. The return page should normally be the start page. Thus, the display pages of the main menu level always characterise the basic display of the predefined view provided that the device was not operated for some time.

The start page
Frequently used operating functions or central functions can be stored on the start page. The start page has a defined display grid. The functions can be operated by direct operation (see page 66-67). Depending on these operation concepts, any number of display and operating functions can be linked to the start page. If a function is linked, the operating and display elements will appear on the start page (figure 8).

The maximum of 2 simultaneously visible functions ensure that the start page is structured very clearly. There are no submenus either. Thus, the assigned functions can be operated quickly and clearly and their status can be read easily. If more than 2 functions are linked to the start page, the list can be switched by the sensor surfaces ﹀ / ︿.

ⓘ The parameter "Page after restart" below the general device parameters defines the display page that is displayed automatically after a restart of the device. Ideally, this is - when using the predefined display pages - the start page.

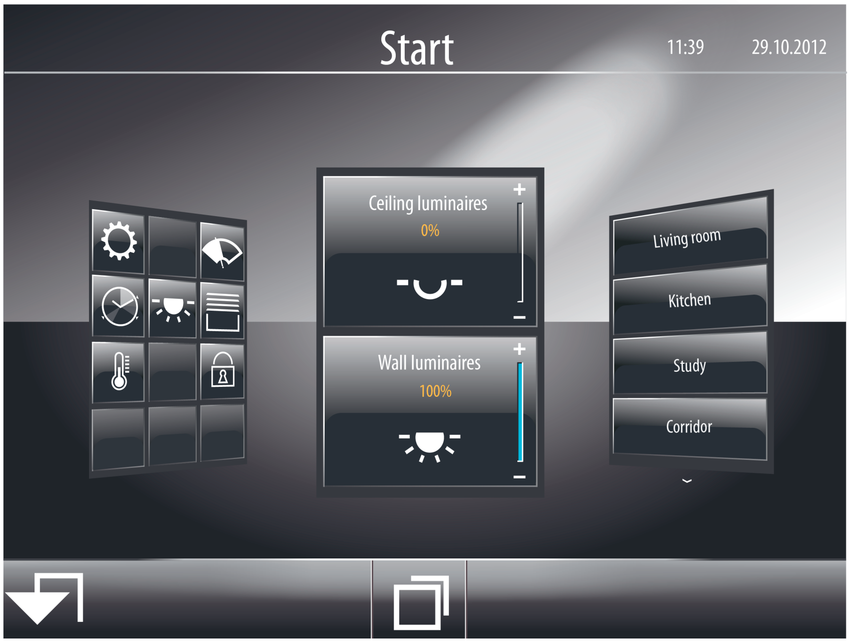


Figure 8: Example of a start page (2 operating and display functions with direct operation)

The room page

Each existing operating and display function must be allocated to a room (area of operation). Functions can be operated and visualized room-oriented via the room page. All rooms created in the configuration software are available on the room page. Each room has a sensor surface that can be touched. The room-oriented submenus are recalled by touching the sensor surface (figure 9). The rooms are each identified in the sensor surface by the name that was entered individually in the configuration software (e.g. "living room", "kitchen" "study").

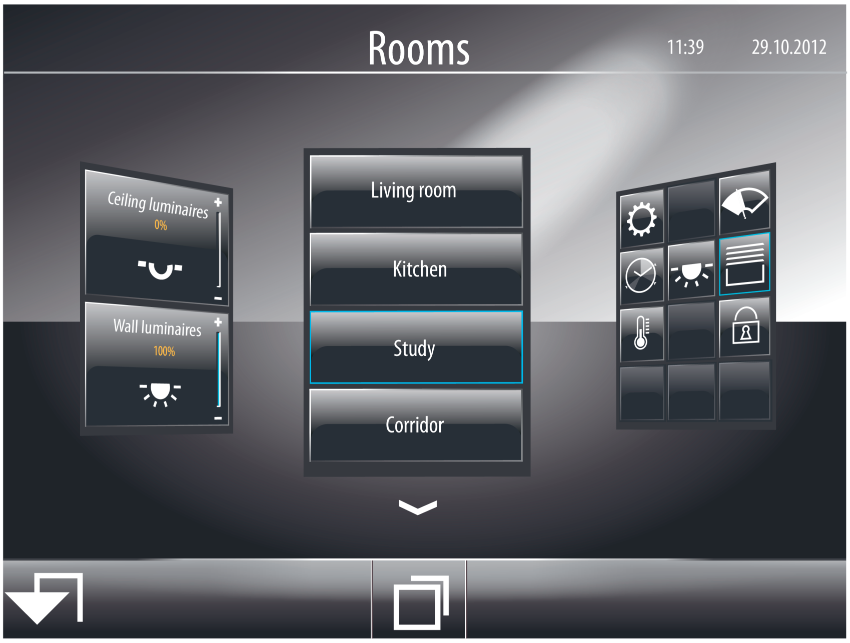


Figure 9: Example of a room page

4 rooms are always displayed simultaneously on the room page. If more than 4 rooms are configured, the room list can be switched by the sensor surfaces ⌄ / ⌃. If there are less than 4 rooms, placeholder surfaces without names are displayed for the rooms that have not been created. These placeholder surfaces have no function.
The room page is always visible in the main menu level.

The function page
Each KNX function can be allocated to a function unit (light, shading, heating, ...). Five standard function units are predefined: "light", "shading", "heating", "security" and "light scene". It is possible to create additional function units in the configuration software with freely definable names. A display icon must be assigned to each function unit. A collection of various icons is available in the configuration software for this purpose.

Furthermore, the device has additional functions in special menu environments which are independent of the 5 standard function units or of the user-defined function units that contain the KNX display and operating functions. A separate display icon is assigned to each supplementary function. The supplementary functions available include...
the timer ◷,
the display page of the signalling system 🚨,
the area for users and system settings ⚙,
the cleaning function for cleaning the sensor surface ◁,
the display page of the fault messages ⚠,
the configuration page of the scenes ⚙,
the configuration page of the presence simulation ⊙,
the display page of the datalogger 📊
and the display page of the browser 🌐.

All the different function units and aforementioned supplementary functions are available on the function page.

The function page contains display elements in the form of square tiles. Each function unit and supplementary function has its own tile. The tile bears the function unit or function symbol for identification. The function-oriented submenus are recalled by touching the sensor surface of a tile (figure 10).
The function page is always visible in the main menu level.

ℹ The number and form of the visible tiles and the arrangement of the icons on the tiles depends on the number of configured function units and functions. The icons, and consequently, the function units are assigned automatically to the tiles. Visible tiles without assignment have no icon and no function.

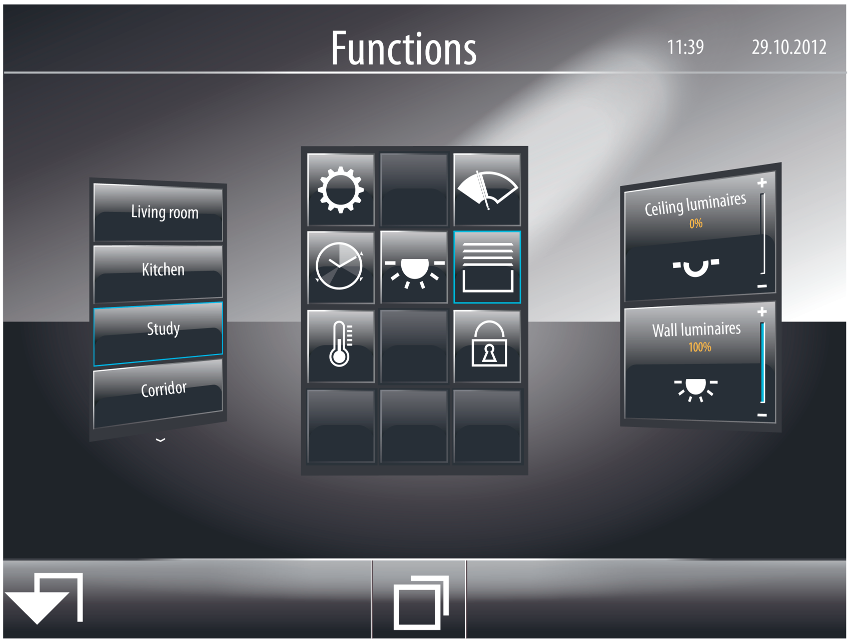

Functions
11:39
29.10.2012
Living room
Kitchen
Study
Corridor
Ceiling luminaires
0%
Wall luminaires
100%
+
−
+
−

Figure 10: Example of a function page with 4 function units (☀, ▭, 🌡, 🔒)
and administrator area ⚙, cleaning function ◀▷ and timer ⏲

ℹ A KNX channel is allocated to a KNX function unit in the configuration software in the parameter node of the corresponding function (parameter family "Representation").

Navigation in the main menu level

The display pages of the main menu level can be selected in sequence using the sensor button ❐ and thus displayed. The display sequence is thereby fixed:
Start page -> Room page -> Function page -> ... (figure 11).

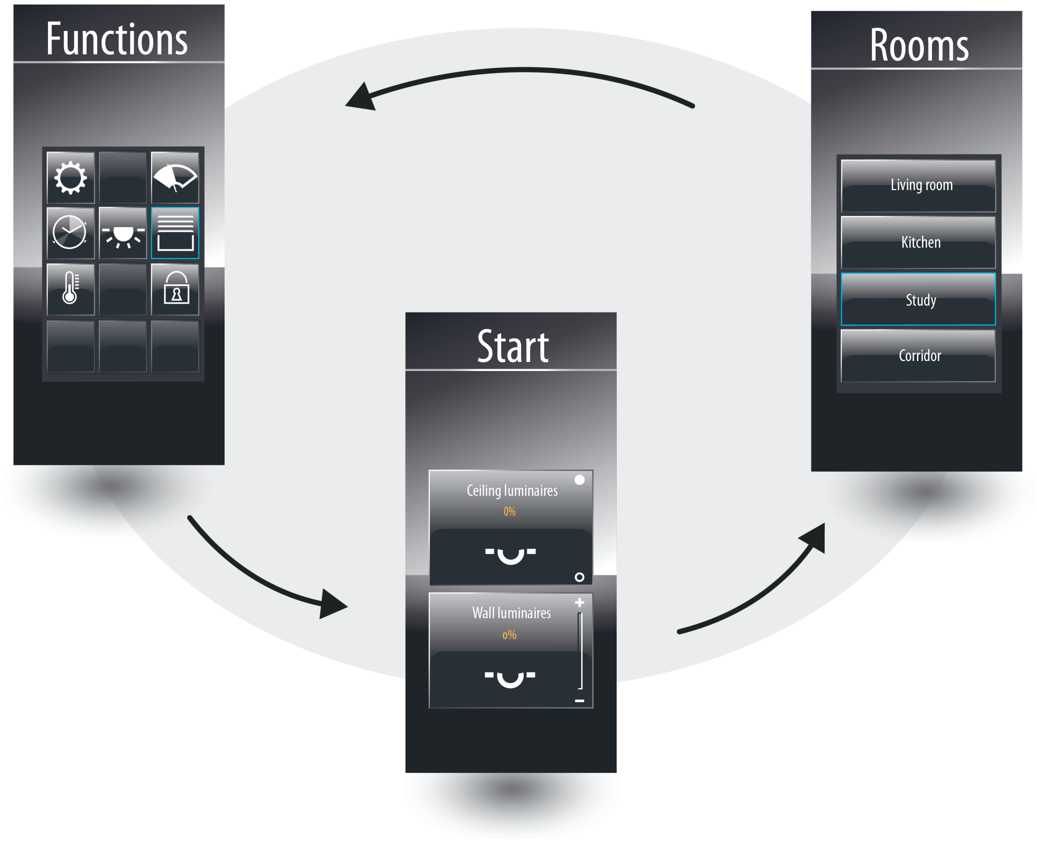

Functions
Rooms
Living room
Kitchen
Study
Corridor
Start
Ceiling luminaires
0%
Wall luminaires
0%

Figure 11: Main menu navigation

It is possible to navigate between the pages by finger-touch-screen operation by pressing on the desired display area (figure 12).

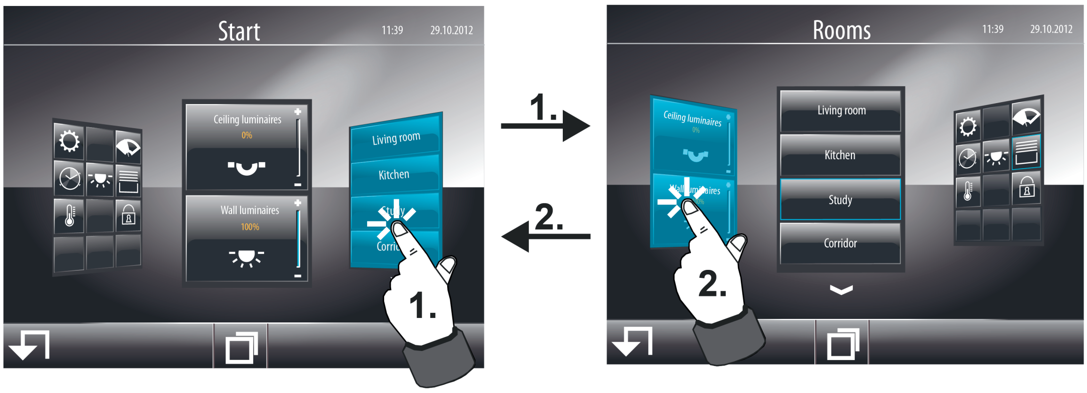

Start
11:39
29.10.2012
Ceiling luminaires
0%
Wall luminaires
100%
Living room
Kitchen
Corridor
1.
1.
2.
Rooms
11:39
29.10.2012
Ceiling luminaires
Living room
Kitchen
Study
Corridor
2.

Figure 12: Example of switching over display pages by finger-touch-screen operation (switching over between start page and room page)

Alternatively, it is also possible to navigate through the display pages of the main menu level using two sensor buttons located outside the display area.
The sensor buttons...

↲ (Return to the start page)

and

❐ (Scrolling in the main menu level)

...make it easier to navigate through the display pages and can be used alternatively for finger operation of the graphic interface (figure 13).

ℹ In contrast to switching over pages by finger-touch-screen operation, which can be applied on all switchable display pages, the sensor buttons only relate to the main menu level. As long as the display is displaying the page of a lower level menu navigation (e.g. operation in the function pages), you will always return to the main menu level by touching a sensor button.

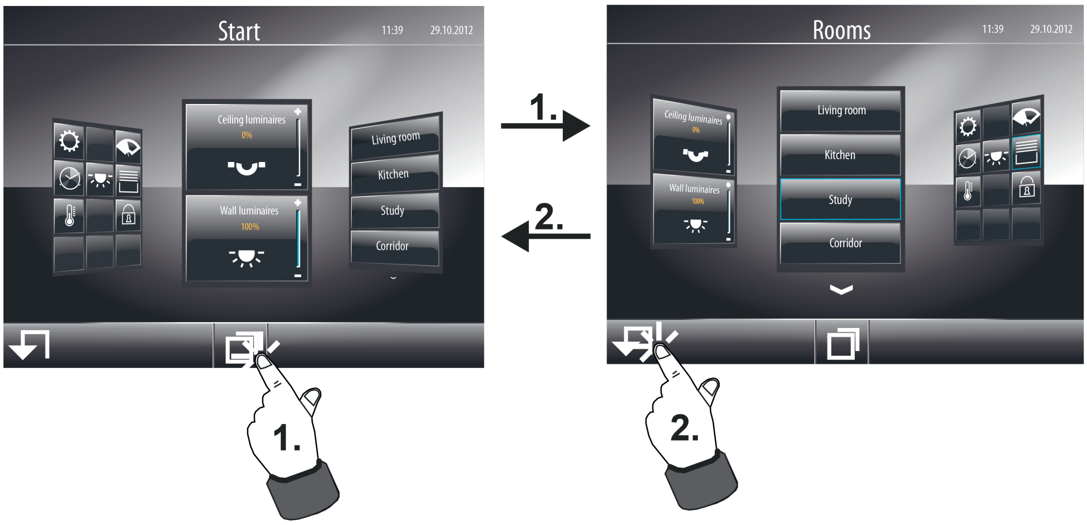


Figure 13: Example of switching over display pages using the sensor buttons.
↵: Return to the start page / ❐: Scroll

Submenu level - Room view

KNX functions, such as switching or dimming functions of a lighting system or control functions of a blind, can each be allocated to a room. As a result, it is possible to control all functions of a room centrally and clearly. The room-oriented submenu, Room view, can be recalled (figure 14) for each room created in the configuration software. This recall takes place via the room page of the main menu level (1.).
As soon as the page of the selected room is opened, all KNX functions allocated to the room will appear in the display. Each function has a sensor surface that can be touched in order to operate this function. The functions are each identified in the sensor surface by their name, which can be entered individually in the configuration software (e.g. "floor lamp", "ceiling luminaires", "Venetian blind left").

Up to 4 functions are displayed simultaneously in a room view. If more than 4 functions are allocated, the channel list can be switched using the sensor surfaces ﹀ / ︿. If only one or two functions are allocated to a room, the display grid is adapted automatically so that larger sensor surfaces are displayed. In the case of 3 allocated functions, a placeholder surface without a text name is displayed for the fourth unallocated function. This placeholder surface has no function. Placeholders are only displayed if no functions at all have been allocated to a room.

All functions within a room view are activated by selection operation. Functions must first be selected. Afterwards, operations are performed by means of the control command.

To return to the main menu level, press the icon "〈 Rooms" (2.) in the Room view in the status line at the top edge of the screen.

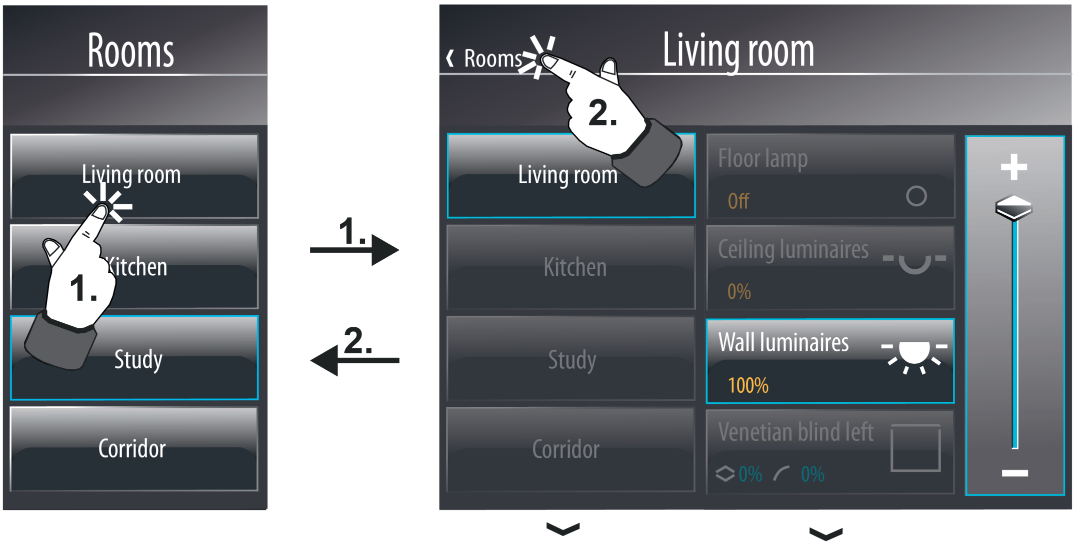

Rooms
Living room
Kitchen
Study
Corridor
1.
1.
2.
❮ Rooms
2.
Living room
Living room
Kitchen
Study
Corridor
Floor lamp
Off
Ceiling luminaires
0%
Wall luminaires
100%
Venetian blind left
0%
0%
+
−

Figure 14: Example of a room view (right)

Submenu level - Function view

All KNX functions created in the configuration software can be allocated to a function unit, in which room-independent and function-oriented control of the building functions is possible. The function-oriented submenu, the function view, can be recalled for each function unit . This recall takes place via the function page of the main menu level (1.). As soon as the page of a function unit is opened, all rooms that have functions allocated to the function unit appear in the display (figure 15). This creates an additional selection layer in which functions can be found more easily.

Up to 4 rooms are displayed simultaneously in the room list. If more than 4 rooms of the function unit are allocated, the list can be switched by the sensor surfaces ﹀ / ︿. If only one or two rooms are allocated to a function unit, the display grid is adapted automatically so that larger sensor surfaces are displayed. In the case of 3 allocated rooms, a placeholder surface without a text name is displayed for the fourth room that is not available. This placeholder surface has no function. Placeholders are only displayed if no functions at all have been allocated to a function unit and thus no rooms either.

To return to the main menu level, press the icon "❮ Functions" (2.) in the function view in the status line at the top edge of the screen.

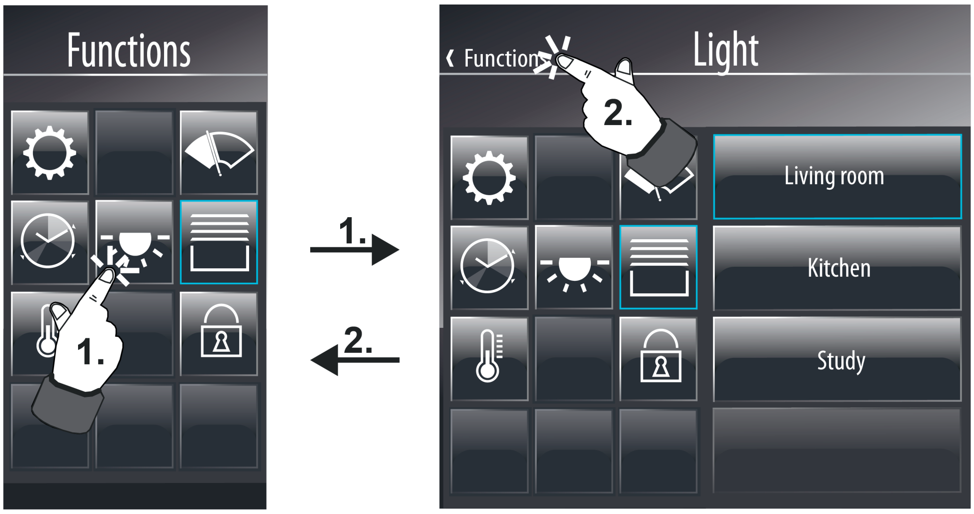

Functions
1.
1.
2.
‹ Functions
Light
2.
Living room
Kitchen
Study

Figure 15: Example of a room list in the function view (right)

If you touch the sensor surface of a room with your finger (3), the device branches to the second submenu of the function control. There, the display shows all KNX functions of the selected room allocated to the selected function unit (figure 16).

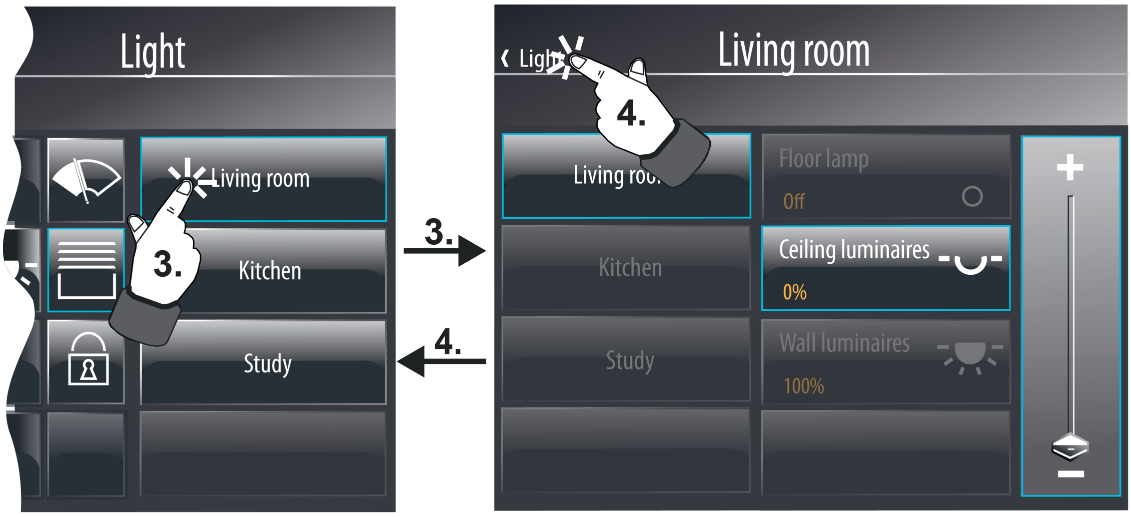

Light
Living room
3.
Kitchen
Study
3.
4.
‹ Light
Living room
4.
Living roo
Kitchen
Study
Floor lamp
Off
Ceiling luminaires
0%
Wall luminaires
100%
+
-

Figure 16: Example of functions in the function view (right)

Each KNX function allocated to the function unit has a sensor surface that can be touched in order to operate this function. The functions are each identified in the sensor surface by their name, which can be entered individually in the configuration software (e.g. "floor lamp", "ceiling luminaires", "wall luminaires").
All functions within the function view are activated by selection operation. Functions must first be selected. Afterwards, operations are performed by means of the control command.

Up to 4 functions are displayed simultaneously in a function view. If more than 4 functions are allocated, the list can be switched by the sensor surfaces ﹀ / ︿. If only one or two functions are allocated to a function unit in the selected room, the display grid is adapted automatically so that larger sensor surfaces are displayed. In the case of 3 allocated functions, a placeholder surface without a text name is displayed for the fourth unallocated function. This placeholder surface has no function. Placeholders are only displayed if no functions at all have been allocated to a function unit in the selected room.

To return to the room list of the function view, press the icon " 〈 " in the submenu of the function control in the status line at the top edge of the screen supplemented by the name of the function unit (4.).

External open page and password protection

Pages of the main menu level (start page, room page, function page) and pages of the submenu levels (individual room or function unit pages, pages of functions) can be displayed by an external bus telegram per recall. For this purpose, each of the display pages mentioned above optionally has its own 1-bit communication object. If the parameter "Enable external open page" is set, which is available separately for external display pages that can be opened, the object "external open page" becomes visible in the configuration software. As as soon as a "1"-telegram is received via this object during the running time of the device, the on-screen display switches over immediately to the corresponding display page. In this way, screen pages can be opened by other bus devices (e.g. by KNX presence detectors if a person is present in the room).

ⓘ The reception of a "0" telegram via the object "external open page" will show no response. The last telegram received defines which page is opened.

ⓘ As an alternative to the external open page, pages can also be displayed by an internal open page (defined jump to a configured page or page return). The operating function "Internal open page" is available for this purpose (see page 116).

The opening of pages can optionally be protected by a password. Up to 4 password levels are available for this in the device. To activate the password protection, a password level must be assigned to a display page in the configuration software. The corresponding page will first then be displayed by an open page request (external or internal open page) if the correct password assigned to the level was entered. A keyboard is available on the screen for entering the password.
Provided that the user is within a password level when navigating through display pages, it is not necessary to enter the password each time the page changes. This first becomes necessary when the user changes to a higher password level. When changing from a higher to a lower password level, it is not necessary to enter the corresponding password.
The activation of a password level after correctly entering the password remains active for approx. 40 seconds. After this time has elapsed, the password of a level must be entered again when changing a page.

ⓘ The display page of the signalling system and the commissioning by means of IP are protected by their own passwords.

ⓘ The password protection is also active in the event of an external open page by the communication object. If a page protected by a password is opened, it is then necessary to enter the correct password on the device via the on-screen keyboard. The display will remain in the keyboard screen until a valid password has been entered and confirmed. No other external open pages will be performed during this waiting state.

Quicklinks

In the footer of the display screen, Quicklinks can be displayed in the Quicklink bar (A) (figure 17). Quicklinks are operating elements with an icon display, which allow an internal open page. Quicklinks are always visible and therefore available on any display page. Up to four Quicklinks are possible in the Quicklink bar.

The target of the open page is defined in the configuration software for each Quicklink. The icon displayed in the operating element is also defined there. An open page can be identified more easily by means of the icon (e.g. identification of a jump to a room page of the building structure or to a function unit page). There are up to 21 different icons to choose from in the configuration software.

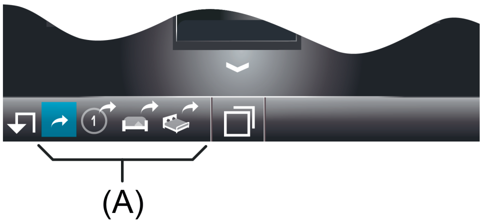


Figure 17: Example of Quicklinks

(A) Quicklink bar (max. of 4 Quicklinks)

Quicklinks are created and configured in the configuration software in their own structure nodes (project bar "Visualisation" -> Structure view "Quicklinks"). They are independent of the display and operating functions of the display structure.

4.2.4.3.2 Operation concept and sensor evaluation

Direct operation / Selection operation

The operation concept for elements on the touch surface is distinguished between selection operation and direct operation. The selection operation is normally intended for the room or function view. KNX display and operating functions must first be selected. Afterwards, operations are performed by means of the control command (switch on or off, move up or down, ...). Alternatively, direct operation is available for the start page. In this case, the control command is also executed simultaneously time by touching the operating element. This operation concept is the same as the operation of a push-button sensor. It is used on the start page for purposefully executing central functions quickly and clearly (e.g. "All ON / All OFF", "room lighting ON / OFF").

Operating elements on the touch surface can - depending on the underlying function - be evaluated as a rocker switch (double-surface principle) or as a button (single surface principle) (see page 67). The function as rocker or button does not depend on the configured operation concept and can therefore be used individually for a selection operation as well as for a direct operation.

For a direct operation, the display surface of an element also corresponds to the sensor surface at the same time, i.e. the function operational area (figure 18). The underlying function is executed immediately by touching the sensor surface with your finger (1.). In the "blind positioning" function, the blind/shutter height and slat position can be specified separately from each other. Therefore, the sensor elements in direct operation top and bottom (rocker switch) are split in two resulting in four operating areas. The blind/shutter height is operated on the left (1a) and the slat position is controlled on the right (1b.).

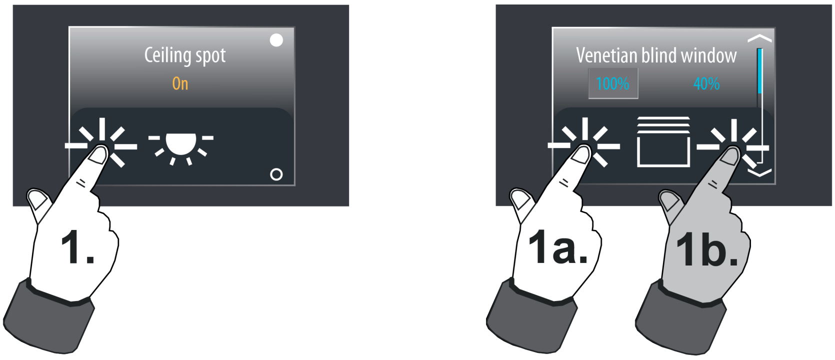


Figure 18: Example for a direct operation
(here: Function "Switching" left and function "blind positioning" right)

This is different in the case of a selection operation. In this case, an operating area is also displayed in the device display next to the display surface of the element (figure 19). Operation requires the selection of an element (1) that can then be operated (2.). Depending on the number of functions available in the room or function unit, up to 4 selectable elements can be displayed simultaneously during a selection operation. The display grid also adapts itself depending on the number of elements. In the case of 2 or more visible elements, the unselected elements remain visible in the display but are greyed out and can therefore not be linked to the control surface. It is possible to change the controllable function at any time by touching another display element with your finger.

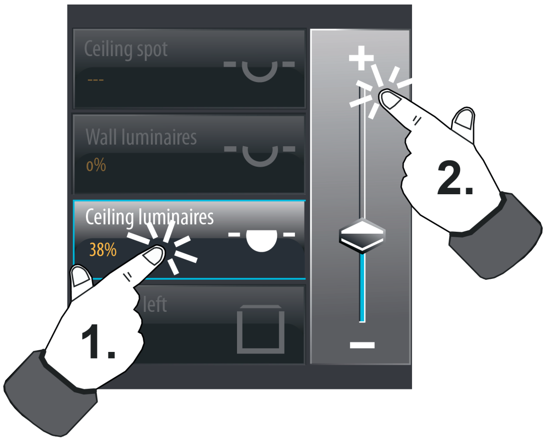


Figure 19: Example of a selection operation
(here: Function "Dimming brightness value")

ⓘ A KNX function with operating and display elements can, for example, be visible on the start page and on a room page. It is quite possible to activate such a function on the start page by direct operation and on the room page by selection operation.

ⓘ With some KNX functions (e.g. "Dimming brightness value" and "Venetian blind/shutter positioning") the brightness value or blind/slat position can be changed continuously in the selection operation by a value slider. It should be noted here that for a direct operation no slider is available for continuously changing the value or position! Here, a value can be adjusted to the value transmitter levels by means of a long top-bottom operation (rocker function) of the sensor surfaces. In the functions "Dimming brightness value", "Venetian blind" and "Rolling shutter positioning", the value transmitter level is preset to 10 %. In the function "Value transmitter adjustment function", the value transmitter level can be defined in the configuration software.

Sensor evaluation

Operating elements on the touch surface can - depending on the underlying function - be evaluated as a rocker switch (double-surface principle) or as a button (single surface principle). A rocker or button evaluation can be configured for the following KNX functions...

- Switching
- Dimming Start/Stop
- Venetian blind Step / Move / Step
- Rolling shutter Step / Move

The following functions are always executed as a rocker function...

- Dimming brightness value
- Blind positioning
- Rolling shutter positioning
- Operating mode switchover 4 x 1 bit
- Operating mode switchover KNX
- Restraint

For all other functions, only simple commands are to be implemented, which is why only one push-button function is provided for this.

The function as rocker or button does not depend on the configured operation concept (see page 66-67) d can therefore be used individually for a selection operation as well as for a direct operation. Only the operating areas differ for buttons or rockers depending on the operation concept. With the direct operation, the display area is also the operating area of the buttons or rockers as well. With the selection operation, the buttons or rockers are arranged in a separate operating area next to the display area.

With the function as a button, the operating element can be touched anywhere. The preset push-button function will then always be executed (figure 20). With the rocker function, the operating element is divided into two sensor areas. These sensor areas are one above the other and must be operated separate from each other (figure 21). It is not permissible to operate both sensor areas of a rocker simultaneously.

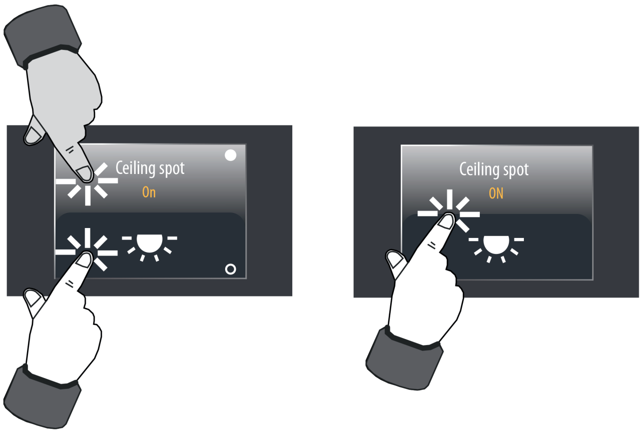


Figure 20: Example of sensor evaluation for direct operation (KNX function: Switching)
left: rocker / right: button

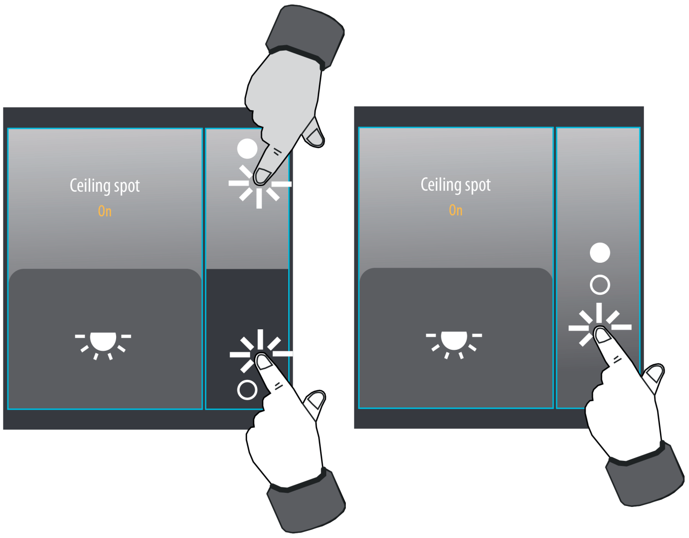


Figure 21: Example of sensor evaluation for selection operation (KNX function: Switching)
left: rocker / right: button

ℹ The sensor areas of a button or rocker for controllable KNX functions are labelled with icons that indicate the command executed when touched. These operating icons are dependent on the configured function. Both figures above show the operating icons of the switching function as an example (● = ON / ○ = OFF).
Other functions display varying operating icons (e.g Dimming **+** / **-**,Venetian blind: ︿ / ﹀, Slat: ⟨ / ⟩).

ⓘ Operating icons always indicate the two operational sensor areas of a rocker switch (top / bottom). Consequently, two icons are then always visible. For a button, the visibility of the operating icons is dependent on the operation concept (direct operation / selection operation), on the configured function and whether status elements are visible.

The commands transmitted to the bus during operation of a button or rocker switch are predefined for some functions, for other functions the command can be configured in the configuration software (figure 22).

Function	**Command for button function**	**Command for rocker function**
Switching	configurable (On, Off, Toggle)	top = ON bottom = OFF
Dimming Start / Stop	TOGGLE (ON-brighter/OFF-darker Toggle)	top = ON/brighter bottom = OFF/darker
Dimming Brightness value	---	top = Increase value (100% - ON) bottom = Reduce value (0% - OFF) Slider = Continuous change of the value
Ven. blind Step / Move	configurable (Up, Down, Toggle) + Stopp	top = Up/Stop bottom = Down/Stop
Shutter Step / Move	configurable (Up, Down, Toggle) + Stopp	top = Up/Stop bottom = Down/Stop
Venetian blind Positioning	---	Blind/shutter: top = Reduce position (Up) bottom = Increase position (Down) Slat: top = Increase position (close slats) bottom = Reduce position (open slats) Slider = Continuous change of the position
Shutter Positioning	---	Blind/shutter: top = Reduce position (Up) bottom = Increase position (Down) Slider = Continuous change of the position
Value transmitter	Transmit value, configurable	---
Value transmitter Adjustment function	Transmit value, Slider	---
Betriebsmodus- umschaltung 4 x 1 Bit	---	Recall operating mode, configurable
Operating mode switchover KNX	---	Recall operating mode, configurable
Scene recall	Recall of an internal scene, configurable	---
Restraint	---	Switch states (ON, OFF, Forcing ON, Forcing OFF)

Figure 22: Button/rocker command depending on the operating function

The functions "KNX Date", "KNX time", "Date / Time", "ASCII Text display", "Collective feedback", "Load type object" and "Access check" are exclusively display functions. Consequently, these elements only display one status and cannot be operated.

ℹ With the rocker functions "Dimming brightness value", "Venetian blind positioning" and "Rolling shutter positioning" no slider is available on the start page for continuously changing the value or position during a direct operation! Here, a value can be adjusted to the value transmitter levels by means of a long top-bottom operation of the sensor surfaces. In the functions "Dimming brightness value", "Venetian blind positioning" and "Rolling shutter positioning", the value transmitter level is preset to 10 %. In the function "Value transmitter adjustment function", the value transmitter level can be defined in the configuration software.

ℹ With the functions "dimming Start/Stop", "Venetian blind Step/Move/Step" and "rolling shutter Step / Move" a distinction is made between a short and long press of a sensor surface. This is necessary in order to distinguish between the commands for switching and dimming and for short and long time operation. The actuation times can be defined in the configuration software. With the functions "Dimming brightness value", "Venetian blind positioning" and "Rolling shutter positioning" the sensor surfaces can be pressed long for value adjustment.

ℹ With the functions "Switching", "Value transmitter", "Value transmitter adjustment function", "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX" it is possible to switch off the operating function completely. In this case, the channel concerned only works as a display function. Consequently, touching the display element does not induce any response.

4.2.4.3.3 Operating and display function "Switching"

1-bit switching telegrams (ON, OFF) can be transmitted to the bus by using the KNX function "Switching". In this way, it is possible to actuate lighting systems in combination with switch actuators. Furthermore, the switching telegram can also be used in another way for executing other control tasks in the KNX system that match the 1-bit data format.

A KNX function for switching has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation).

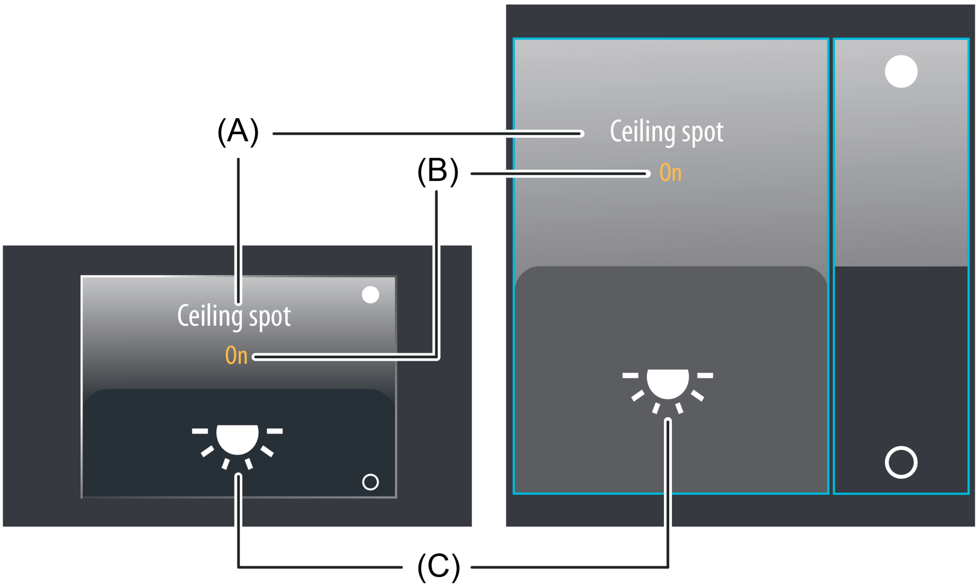


Figure 23: Example of an operating and display element of the function "Switching"
left: direct operation / right: selection operation

(A) Text name
(B) Status text
(C) Status icon

ℹ The function "Switching" can be executed as a rocker or push-button function depending on the parameterisation. The figure shows the rocker configuration as an example.

Status elements

The display area contains different display elements (figure 23) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "ceiling spot"). In addition, a status text (B) can be displayed below the name, which visualises different texts (e.g. "Off" / "On" or "Absent" / "Present") in the display depending on the object value of the switching status feedback ("0" / "1"). After a device reset, the display shows "---" until a feedback object value of the status text is received or predefined.

Similarly to the status text, a symbol (C) can be displayed in the lower display area. A parameter in the configuration software defines which type of status icon is used in the display element. This makes it possible to adapt the icon display to the activated function (e.g. switching of lighting). The configured status icon changes depending on the switching state thereby enabling the state of the controlled KNX function to be read clearly (e.g. -◡-: Lighting OFF, ☀: Lighting ON).

The status text and icon can be omitted optionally.

Objects

The function "Switching" has up to 2 KNX communication objects...

- "Switching" (1-bit transmitting and optional receiving):
  Switching telegrams are transmitted to the bus via this object after pressing the sensor element. This can cause a switching channel of a KNX switch actuator to be activated immediately, for example.
  If the parameter "Use feedback object" is not selected, the switching state received via this object also influences the status indications. This is advisable, for instance, if the activated KNX switch actuator does not have any separate feedback objects.

- "Switching feedback" (1-bit receiving):
  Through this object the device can receive a switching status feedback that a switch actuator transmits, for example. This influences the status text and status icon that can be displayed in the display area of the function element. The feedback of the switching status must be transmitted by the "actively transmitting" actuator.
  If the activated KNX switch actuator does not have a separate status feedback, the parameter "Use feedback object" can be deselected whereby the status indications are activated via the object "Switching".

4.2.4.3.4 Operating and display function "dimming Start/Stop"

1-bit switching telegrams (ON, OFF) and 4-bit dimming telegrams (relative dimming: dimming up or dimming down by a dimming increment and stop telegram) can be transmitted to the bus by using the KNX function "dimming (Start/Stop)" . In this way, it is possible to actuate lighting systems in combination with dimmer actuators. Likewise, KNX speed controllers can be addressed whereby motors can be switched on and off and the speed changed.

A KNX function "dimming (Start/Stop)" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element distinguishes between short and long operations.
A short sensor operation triggers switching telegrams. Dimming telegrams are transmitted to the bus by means of long operations of the sensor surfaces. A stop telegram is triggered automatically by releasing a long pressed sensor element whereby a dimming process is stopped at the current brightness value.
The time for short and long operations can be adjusted in the configuration software.

ⓘ The relative dimming step width is unalterably set to 100 % (maximum step width) in the function "dimming Start / Stop". In this way, the entire brightness range of a lighting system can be controlled simply by a long button-press. The stop telegram when releasing is also predefined.

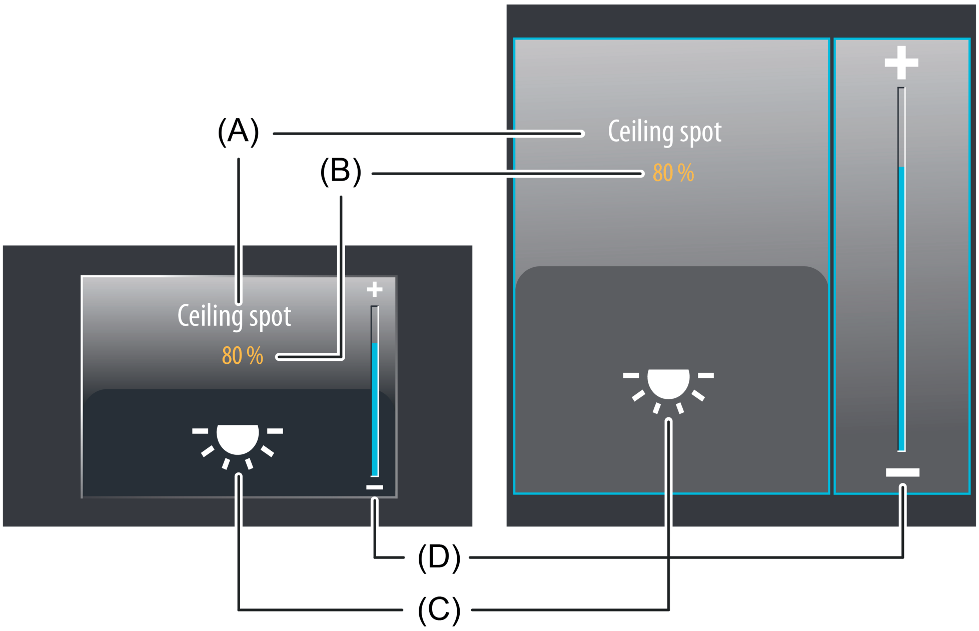


Figure 24: Example of an operating and display element of the function "Switching" "dimming (Start/Stop)"
left: direct operation / right: selection operation

(A) Text name
(B) Status value
(C) Status icon
(D) Bar graph in the sensor area

ⓘ The function "dimming Start/Stop" can be executed as a rocker or push-button function depending on the parameterisation. The figure shows the rocker configuration as an example.

Status elements

The display area contains different display elements (figure 24) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "ceiling spot"). In addition, a status value (B) can be displayed below the name, which displays brightness values in plain text ("0...100 %"), for example, depending on the object value of the dimming value feedback of the dimmer actuator addressed. After a device reset, the display shows "---%" until a feedback object value of the status text is received.
Similarly to the status value, a symbol (C) can be displayed in the lower display area. If an icon is to be displayed, the "Lighting" icon is always used. The characteristic of the status icon, in which the brightness state of the controlled KNX function can be clearly read (ˉ◡ˉ, changes depending on the dimming status: Lighting OFF or low brightness, ☀: Lighting maximum brightness, interim values by symbol with fewer light beams).
The status value and icon can be omitted optionally.

In the function "dimming (Start/Stop)", a bar graph (D) is displayed in the sensor element. This bar graph displays brightness values in graphic form based on the object value of the dimming value feedback of the dimmer actuator addressed. The bar graph rises when the brightness of the activated lighting becomes greater. Similarly, the bar graph falls when the brightness decreases. At full deflection, the maximum brightness is set. If the bar graph shows no deflection, the lighting is switched off.
The bar graph is visible when a feedback object is used and the value is to be displayed and normally supplements the status indication by status value and status icon.

Objects

The KNX function "dimming (Start/Stop)" has up to 3 KNX communication objects...

- "Switching (1-bit transmitting):
  Switching telegrams are transmitted to the bus via this object after a short touch of the sensor element. A connected lighting system, for example, is switched on as a result. KNX dimmer actuators then normally set the configured switch-on brightness.

- "Dimming (Start/Stop)" (4-bit transmitting):
  Dimming telegrams are transmitted to the bus via this object after a long press of the sensor element (step width 100%). A connected lighting system is dimmed as a result. A stop telegram is triggered via this object by releasing the sensor element.

- "Dimming feedback brightness value" (1-byte receiving):
  Through this object the device can receive a brightness value feedback that a dimmer actuator transmits, for example. The status value, status icon and bar graph are influenced as a result. Consequently, the feedback object must always be configured properly so that the status indications of the channel element work correctly if these are visible. The feedback of the brightness value must be transmitted by the "actively transmitting" actuator. If the activated KNX dimmer actuator does not have a separate brightness value feedback, the parameter "Use feedback object" can be deselected whereby all the status indications are then no longer available either, however.

ⓘ The object "Dimming feedback brightness value" interprets received values on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 % and displayed in the device display.

i Dimmer actuators normally transmit brightness values as feedback when the dimming processes have been completed, i.e. when dimmed or started brightness values have been set valid. For this reason, status indications of the channel element concerned do not normally change during a press of the sensor surface, but only when the buttons are released and the dimming processes are stopped. By contrast, a displayed status value can already change even during an operation if the dimmer actuator has set a minimum or maximum brightness or cannot pass through the entire brightness range due to disabling functions.
The feedback of a brightness value is returned with a delay after switching on or off based on the dimming speed set in the dimmer actuator. As a result, the status indications of the channel element update themselves with a slight delay after releasing the sensor surface.

4.2.4.3.5 Operating and display function "Dimming brightness value"

1-byte brightness value telegrams (absolute dimming via 1-byte values in compliance with KNX DPT 5.001 scaling) can be transmitted to the bus by using the KNX function "Dimming brightness value". In this way, it is possible to actuate lighting systems in combination with dimmer actuators. Likewise, KNX speed controllers can be addressed whereby motors can be switched on and off and the speed changed.
The difference between the channel functions "Dimming Start/Stop" and "Dimming brightness value" is in the data formats of the communication objects.

A KNX function "Dimming brightness value" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a rocker function and distinguishes between short and long operations.
A short sensor operation triggers value telegrams "100 %" or "0 %", depending on the operated sensor surface **+** or **-**. In this way, as with a switching operation, the activated load is switched on and off. Brightness value telegrams are transmitted to the bus gradually in a defined time interval by means of long operations of the sensor surfaces **+** or **-**. The device then increases or decreases the value cyclically during the operation by the specified value transmitter level of 10 % and transmits the values as a brightness setting. The value sequence generated in this way is converted to a dimming process by the activated dimmer actuator. The time between two value telegrams is preset to 600 ms. The time must be adjusted to the dimming speed of the dimmer actuator in order to attain a constant and interruption-free dimming process.
The time for short and long operations can be adjusted in the configuration software.

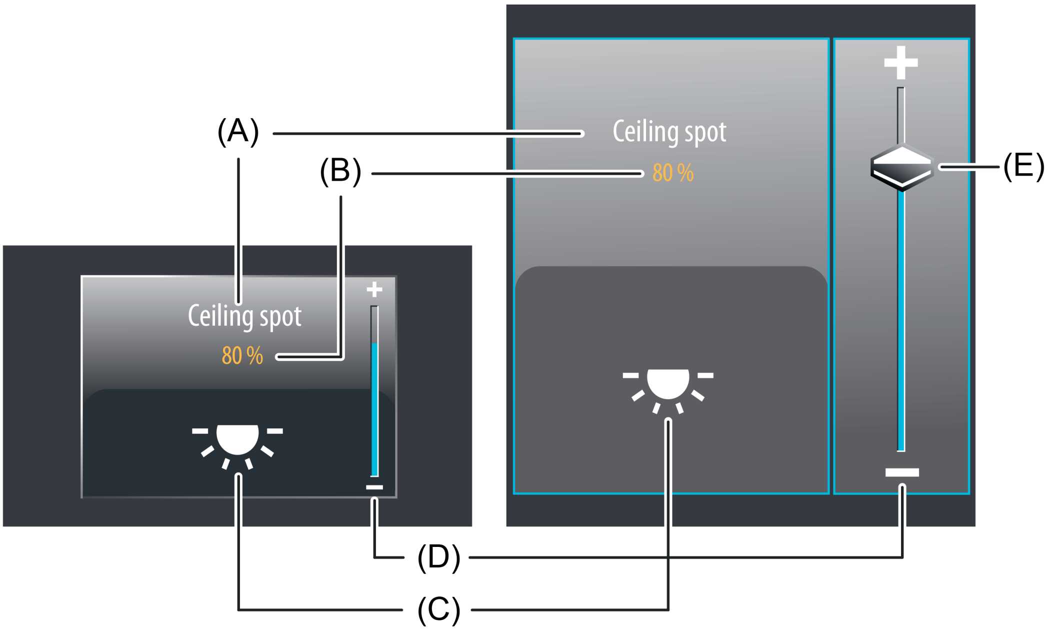


Figure 25: Example of an operating and display element of the function "Dimming brightness value"
left: direct operation / right: selection operation

(A)	Text name
(B)	Status value
(C)	Status icon
(D)	Bar graph in the sensor area
(E)	Slider in the sensor area

Slider

In the selection operation, a slider (E) is available in addition to the sensor surfaces **+** or **-** for operating switching or continuous dimming processes (figure 25). It is possible to specify brightness values directly with graphic support using the slider. For this purpose, the slider can be set by finger pressure or continuously moved. To set the slider, you must touch the slider area at the required brightness level with your finger. The slider then jumps immediately to the required position. At the same time, the device transmits the brightness value specified thus as a presetting to the bus.
Alternatively, you can move the slider continuously in the slider area with your finger. During the movement of the slider, the device transmits values according to the specified value transmitter level of 10 % time-controlled and gradually. As a result, the brightness of the activated lighting already changes, for example, during the slider adjustment whereby the operator immediately receives a visual brightness feedback. The time that must elapse before the device outputs a new brightness level during an adjustment is preset to 600 ms. Thus, the time of the value adjustment and the value transmitter level affect the control speed of the slider.

ⓘ The current brightness value of the activated dimming channel is indicated in the sensor element as a bar graph (see Functional description of the display elements below). The slider is located graphically before the bar graph and is adapted to the position of the bar graph if no slider operation occurs. The slider therefore responds to the feedback telegrams of the dimmer actuator or alternatively to the preset value by operation similarly to the bar graph.
It is generally recommended to move the slider as slowly as possible and to leave your finger briefly (approx. 1s) on the operating element after reaching the setpoint so that the status indicator in the bar graph matches the current slider position and ideally no position correction takes place at the end of the operation.

ⓘ It should be noted that for a direct operation no slider is available for continuously changing the value! Here, a value can be adjusted to the specified value transmitter level (10 %) by means of a long top-bottom operation of the sensor surfaces.

Status elements

The display area contains different display elements (figure 25) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "ceiling spot"). In addition, a status value (B) can be displayed below the name, which either displays brightness values in plain text ("0...100 %") depending on the object value of the dimming value feedback of the dimmer actuator addressed or alternatively directly depending on the preset dimming value of the operating element. After a device reset, the display shows "---%" until a feedback object value of the status text is received or a brightness value is specified.
Similarly to the status value, a symbol (C) can be displayed in the lower display area. If an icon is to be displayed, the "Lighting" icon is always used. The characteristic of the status icon, in which the brightness state of the controlled KNX function can be clearly read (¯◡¯, changes depending on the dimming status: Lighting OFF or low brightness, ☀: Lighting maximum brightness, interim values by symbol with fewer light beams).
The status value and icon can be omitted optionally.

In the function "Dimming brightness value", a bar graph (D) is displayed in the sensor element. This bar graph displays brightness values in graphic form based on the object value of the dimming value feedback of the dimmer actuator addressed or alternatively based on the preset value by operation. The bar graph rises when the brightness of the activated lighting becomes greater. Similarly, the bar graph falls when the brightness decreases. At full deflection, the maximum brightness is set. If the bar graph shows no deflection, the lighting is switched off. The bar graphs is always visible and normally supplements the status indication by status value and status icon. The bar graph is located graphically behind the slider.

Keyboard for entering values

In addition to the possibilities of specifying a brightness value using the sensor surfaces **+** / **-** or slider, a keyboard can optionally be shown in the display. It is possible to specify a brightness value directly using the keyboard. The keyboard becomes visible by pressing the display area for a long time with your finger (approx. 1s) if this was also enabled by parameter configuration in the configuration software. Using the keyboard, any brightness value ranging from 0...100% can be entered numerically and applied by pressing the ✓ button. After applying the value, it is accepted as a preset value and transmitted to the bus.
The entry can be terminated without applying any value by touching the sensor surface **x** in the keyboard.

ⓘ It is only possible to specify a brightness value via the keyboard in selection operation on the room or function pages.

Objects

The KNX function "Dimming brightness value" has up to 2 KNX communication objects...

- "Dimming brightness value" (1-byte transmitting and optional receiving):
  Value telegrams (0...255) are transmitted to the bus via this object after pressing the sensor elements. This can cause a dimmer actuator to be activated.
  If the parameter "Use feedback object" is not selected, the brightness value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX dimmer actuator does not have any separate brightness value feedback objects.

- "Dimming feedback brightness value" (1-byte receiving):
  Through this object the device can receive a brightness value feedback that a dimmer actuator transmits, for example. The status value, status icon and bar graph are influenced as a result. The feedback of the brightness value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX dimmer actuator does not have a separate brightness value feedback, the parameter "Use feedback object" can be deselected whereby the status indications are activated via the object "Brightness object".

ⓘ The objects interpret values to be sent or received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 %.

ⓘ During an operation, the value of the object "Dimming feedback brightness value" is not evaluated. With a long press of the sensor elements **+** / **-** or when moving the slider, a continuous value adjustment can take place on the bus. During this value adjustment, all status elements of the channel element are updated continuously by value simulation. The display elements first react again to the feedback object value of the dimmer actuator after a short waiting time once the operation has been completed.

4.2.4.3.6 Operating and display function "Venetian blind Step / Move / Step"

1-bit switching telegrams in compliance with the KNX data point types 1.007 (Step) and 1.008 (UpDown) can be transmitted to the bus by using the KNX function "Venetian blind/shutter Step/Move/Step". In this way, it is possible to activate Venetian blinds (incl. slats) by means of short time and long time telegrams in combination with appropriate actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.

The sensor element distinguishes between short and long operations. Depending on this, different telegrams are transmitted to the bus...

- Immediately on pressing a sensor surface the device transmits a short time telegram to the bus (figure 26), whereupon a running drive is stopped and the "time between short and long time operation" T1 is started internally. If the pressed sensor element is released again within T 1, the device transmits no further telegram. This short time serves the purpose of stopping a continuous movement.
  The "time between short and long time operation" is configured in the configuration software and should be selected shorter than the short time operation of the actuator to avoid any jerky movement of the activated drive.
- If the sensor element is kept depressed longer than T1, the device transmits a long time telegram after the end of T1 for starting up the drive and time T2 ("slat adjusting time") is started internally.
- If the sensor element is released again within the slat adjusting time, the device transmits another short time telegram. This function is used for adjusting the slats of a blind. The function permits stopping the slats in any position during their rotation.
  The "slat adjusting time" to be configured in the configuration software should be chosen as required by the drive for a complete rotation of the slats. If T2 is selected longer than the complete running time of the drive, a pushbutton function is possible as well. Here, the drive only remains on while the sensor element is kept depressed.
- If the sensor element is kept depressed longer than the "slat adjusting time", the device transmits no further telegram. The drive remains on until the end position is reached.

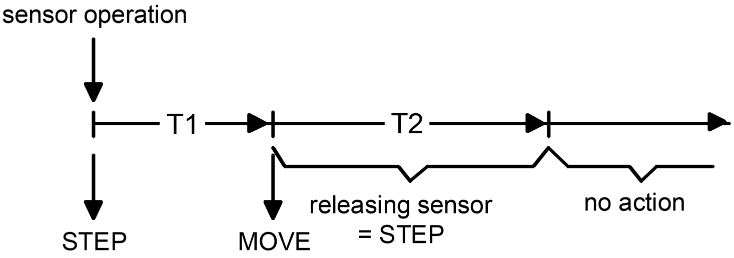


Figure 26: Telegram concept when a sensor surface of the channel function is touched "Venetian blind Step / Move / Step"

ℹ Short time and long time commands are transmitted in a similar manner to the bus during a sensor operation (shutter/blind control). The "slat adjusting time" of the KNX channel must be adjusted to the actual travelling time of the activated slat in order for a slat operation to be reasonably possible in the course of this!

A KNX function "Venetian blind Step /Move/Step" for switching has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation).

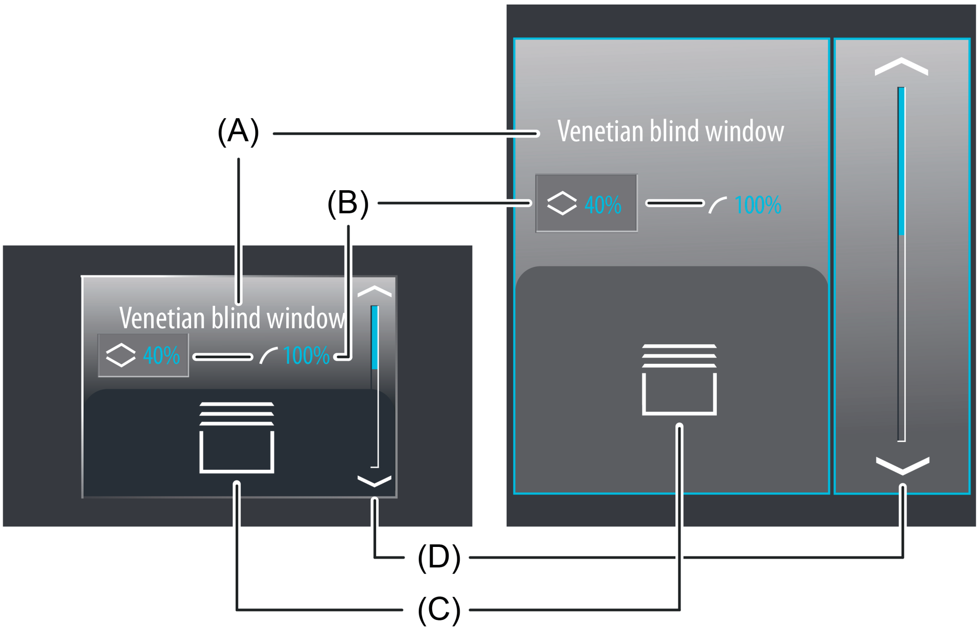


Figure 27: Example of an operating and display element of the function "Venetian blind Step /Move/Step"
left: direct operation / right: selection operation

(A) Text name
(B) Status values for blind/shutter (left) and (right)
(C) Status icon blind (configurable)
(D) Bar graph in the sensor area

i The function "Venetian blind Step /Move/Step" can be executed as a rocker or push-button function depending on the parameterisation. The figure shows the rocker configuration as an example.

Status elements

The display area contains different display elements (figure 27) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "Venetian blind window"). In addition, two status values (B) for blind/shutter height and slat position can be displayed below the name, which display position values in plain text ("0...100 %") depending on the object values of the position feedbacks of the Venetian blind actuator addressed. After a device reset, the display shows "---%" until feedback object values of the status values are received.
Similarly to the status values, a symbol (C) for the blind/shutter height can be displayed in the lower display area. The displayed icon can be defined in the configuration software whereby an adjustment to the type of hanging (Venetian blind, awning, vertical slat, roof window) is possible. The character of the status icon changes depending on the position thereby enabling the current blind/shutter position of the activated KNX channel to be read clearly. The status values and icon can be omitted optionally. The slat position has no icon.

In the channel function "Venetian blind Step /Move/Step", a bar graph (D) is displayed in the sensor element . The bar graph displays position values in graphical form based on the position feedback of the Venetian blind actuator addressed. The bar graph always displays the blind/shutter position.
In the shutter/blind control, the bar graph falls from the top to the bottom when the position of the activated shading system becomes greater. Similarly, the bar graph rises when the position becomes less. At full-scale deflection of the bar graph, the maximum shutter/blind position has been reached. If the bar graph does not show any deflection, the shutter/blind is completely

retracted.
The bar graph is visible when a feedback object is used and the value is to be displayed and normally supplements the status indication by status value and status icon.

Objects

The KNX function "Venetian blind Step /Move/Step" has up to 4 KNX communication objects...

- "Short-time operation" (1-bit transmitting):
  Short-time telegrams are transmitted to the bus via this object after a short touch of the sensor element. This causes any ongoing drive runs to be stopped. Alternatively, blinds/shutters or slats are activated briefly since the drive is being activated from the "Stop" state. KNX blind or shutter actuators then execute the configured short-time operation (Step).

- "Long-time operation" (1-bit transmitting):
  Long time telegrams (up, down) are transmitted to the bus via this object after a long press of the sensor element. This enables activated blinds/shutters of shading systems to be controlled until the end positions. KNX blind or shutter actuators additionally execute the configured long-time operation (Move).
  A short time telegram (see object "Short-time object") can interrupt ongoing drive runs of the long time operation (Stop) thereby enabling a blind/shutter to be stopped at any desired point.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value, status icon and also the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind actuator does not have a feedback for the blind/shutter position, the parameter "Use feedback object" can be deselected whereby all the status indications are then no longer available either, however.

- "Slat position feedback" (1-byte receiving):
  Through this object the device can receive a position feedback for the slat position that a Venetian blind actuator transmits, for example. The status value for the slat visualisation is influenced as a result. The feedback of the position value must also be transmitted here by the "actively transmitting" actuator.
  If the activated KNX Venetian blind actuator does not have a feedback for the slat position, the parameter "Use feedback object" can be deselected whereby the status value indication is then no longer available either, however.

ℹ The objects "Venetian blind position feedback" and "Slat position feedback" interpret values received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 % and displayed in the device display.

ℹ Since Venetian blind or shutter actuators normally transmit position values as feedback, the activated motors stop when driver runs have been completed. For this reason, status indications of the function element concerned do not normally change during a press of the sensor surface, but only when the buttons are released and the drive runs are stopped. By contrast, a displayed status value can already change even during an operation if the drive is already in the end position or cannot pass through the entire position range due to disabling functions.

4.2.4.3.7 Operating and display function "Venetian blind positioning"

With the function "Venetian blind/positioning" it is possible to transmit 1-byte position telegrams (values in compliance with KNX DPT 5.001 Scaling) to the bus. In this way, it is possible to activate Venetian blinds (incl. slats) by means of position values in combination with shutter actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.
The difference between the functions "Venetian blind/shutter Step/Move/Step" and "Venetian positioning" lies in the data formats of the communication objects.

A KNX function "Venetian blind positioning" for switching has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a rocker function and distinguishes between short and long operations.
A short sensor operation depending on the sensor surface ︿ / ﹀ (for a shutter/blind control) or ⟨ / ⟩ (for slat control) triggers value telegrams "100 %" or "0 %". In this way, the activated blind/shutter or slats can be moved to the end position. Position value telegrams are transmitted to the bus gradually in a defined time interval by means of long operations of the sensor surfaces. The device then increases or decreases the value cyclically during the operation depending on the specified value transmitter level of 10 % and transmits the values as a position setting. The value sequence generated in this way is converted to a movement by the activated Venetian blind. The time between two value telegrams is preset to 600 ms. The travelling time of the actuator channel must be adjusted to this time in order to attain a constant and interruption-free movement operation.
The time for short and long operations can be adjusted in the configuration software.

ⓘ Finger pressure on the status values influences the operation via the sensor surfaces and the representation of the operating icons. If the slat status value (right) was last pressed, the operating icons ⟨ and ⟩ are displayed. This should indicate the adjustment possibility of the slats by means of position setting. If the Venetian blind/shutter value was last pressed in the display area (left), the operating icons ︿ and ﹀ are displayed. This indicates the adjustment possibility of the blind/shutter height by means of position setting. Depending on this selection, position telegrams are either transmitted to the bus via the object "shutter/blind object" or via the object "slat object". The selection of the operating icons therefore influences the bus telegrams.

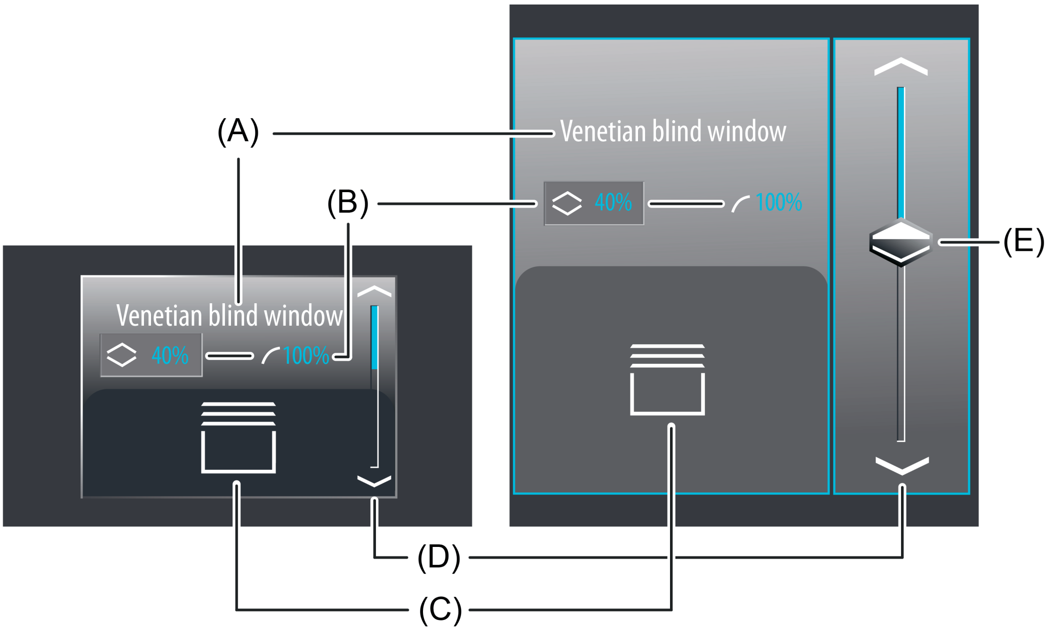


Figure 28: Example of an operating and display element of the function "Venetian blind positioning"
left: direct operation / right: selection operation

- (A) Text name
- (B) Status values for blind/shutter (right) and (left)
- (C) Status icon blind/shutter or slat (configurable)
- (D) Bar graph in the sensor area
- (E) Slider in the sensor area
- ℹ The representation of the bar graph in the sensor area changes depending on whether or not slat or blind/shutter height are controlled. The figure shows a bar graph with blind/shutter height display as an example.

Slider

In the selection operation, a slider (E) is also available in addition to the sensor surfaces ︿ / ﹀ or ⟨ / ⟩ for positioning in the end positions or for value adjustment (figure 28). It is possible to specify positions for slat or blind/shutter heights directly with graphic support using the slider via the status values depending on the selection. For this purpose, the slider can be set by finger pressure or continuously moved. To set the slider, you must touch the slider area at the required position with your finger. The slider then jumps immediately to the required position. At the same time, the device transmits the position value specified thus as a setting to the bus. Alternatively, you can move the slider continuously in the slider area with your finger. During the movement of the slider, the device transmits values according to the specified value transmitter level of 10 % time-controlled and gradually. As a result, the slat or blind/shutter position of the activated system already changes during the slider adjustment, for example, whereby in the ideal case the operator immediately receives a visual feedback on the drive movement and position. The time that must elapse before the device outputs a new position level during an adjustment is preset to 600 ms. Thus, the time of the value adjustment and the value transmitter level affect the control speed of the slider.

ℹ The current position of the selected element (slat or blind/shutter) is indicated in the sensor element as a bar graph (see Functional description of the display elements below). The slider is located graphically before the bar graph and is adapted to the position of the bar graph if no slider operation occurs. Thus, the slider responds to the feedback telegrams of the shutter actuator or alternatively to the preset value by operation similarly to the bar graph.

ℹ It should be noted that for a direct operation no slider is available for continuously changing the value! Here, a value can be adjusted to the specified value transmitter level (10 %) by means of a long top-bottom operation of the sensor surfaces.

Status elements

The display area contains different display elements (figure 28) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "Venetian blind window"). In addition, two status values (B) for blind/shutter height and slat position can be displayed below the name, which display position values in plain text ("0...100 %") either depending on the object values of the position feedbacks of the Venetian blind actuator addressed or alternatively directly depending on the position value presetting of the operating element. After a device reset, the display shows "---%" until feedback object values of the status values are received or position values are specified. Similarly to the status values, a symbol (C) can be displayed in the lower display area. Depending on the selection of the status values the status icon for the slat position or for the blind/shutter height is displayed in the display area.
The icons displayed for the blind/shutter height and slat position can be defined in the configuration software whereby an adjustment to the type of hanging (Venetian blind, awning, vertical slat, roof window or slat adjustment) is possible. The character of the status icons change depending on the position thereby enabling all current positions of the activated KNX function to be read clearly. The status values and icon can be omitted optionally.

In the function "Venetian blind positioning", a bar graph (D) is displayed in the sensor element. The bar graph displays position values in graphical form based on the position feedback of the Venetian blind actuator addressed or alternatively based on the preset value by operation. In selection operation, the bar graph visualises the blind/shutter height or alternatively the slat position depending on which status value was last selected for operation in the display area. In direct operation the bar graph always displays the blind/shutter position only.
The position orientation of the bar graph (ascending, descending) depends on whether the slat control or blind/shutter control was selected. In the shutter/blind control, the bar graph falls from the top to the bottom when the position of the activated shading system becomes greater. Similarly, the bar graph rises when the position becomes less. In the slat control, the bar graph orientates itself from the bottom to the top. In this case, the bar graph rises when the position of the activated slat becomes greater. Similarly, the bar graph falls when the position decreases. At full-scale deflection of the bar graph, the maximum shutter/blind position has been reached or the slats are completely closed. If the bar graph does not show any deflection, the shutter/blind is completely retracted or the slats are completely opened.
The bar graphs is always visible and normally supplements the status indication by status value and status icon. The bar graph is located graphically behind the slider.

Keyboard for entering values

In addition to the possibilities of specifying position values using the sensor surfaces ︿ / ﹀ or 〈 / 〉 or slider, a keyboard can optionally be shown in the display. It is possible to specify a position value directly using the keyboard. The keyboard becomes visible by pressing a display area of the status icon or status values for slat or blind/shutter for a long time with your finger (approx. 1s) if this was enabled by parameter configuration in the configuration software. Using the keyboard, any position value ranging from 0...100% can be entered numerically and applied by pressing the ✓ button. After applying the value, it is accepted as a preset value and transmitted to the bus.

The entry can be terminated without applying any value by touching the sensor surface **x** in the keyboard.

ⓘ It is only possible to preset a position value via the keyboard in selection operation on the room or function pages.

Objects

The KNX function "Venetian blind positioning" has up to 4 KNX communication objects...

- "Venetian blind position" (1-bit transmitting and optional receiving):
  Value telegrams (0...255) for the blind/shutter height setting are transmitted to the bus via this object after pressing the sensor elements. This can cause a blind position object (e.g. "Position Venetian blind", "Position rolling shutter/awning", "Position venting louver"...) of a blind or shutter actuator to be activated.
  If the parameter "Use feedback object" is not selected, the position value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX Venetian blind or shutter actuator does not have any separate feedback objects for the blind/shutter position.

- "Slat position" (1-bit transmitting and optional receiving):
  Value telegrams (0...255) for the slat position setting are transmitted to the bus via this object after pressing the sensor elements. This can cause a slat position object of a shutter actuator to be activated.
  If the parameter "Use feedback object" is not selected, the position value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX Venetian blind actuator does not have any separate feedback objects for the slat position.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value, status icon and also the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind or shutter actuator does not have a separate status feedback for the blind/shutter height, the parameter "Use feedback object" can be deselected whereby the blind/shutter status indications are activated via the object "Venetian blind position".

- "Slat position feedback" (1-byte receiving):
  Through this object the device can receive a position feedback for the slat position that a Venetian blind actuator transmits, for example. The status value, status icon and bar graph for the slat visualisation are influenced as a result. The feedback of the position value must also be transmitted here by the "actively transmitting" actuator.
  If the activated KNX Venetian blind actuator does not have a separate status feedback for the slat position, the parameter "Use feedback object" can be deselected whereby the slat status indications are activated via the object "Slat position".

ⓘ The objects interpret values to be sent or received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 %.

ℹ During an operation, the values of the objects "Venetian blind position feedback" and "Slat position feedback" are not evaluated. With a long press of the sensor elements ︿ / ﹀ or 〈 / 〉 or when moving the slider, a continuous value adjustment can take place on the bus. During this value adjustment, all status elements of the function element are updated continuously by value simulation. The display elements first react again to the feedback object value of the Venetian blind or shutter actuator after a short waiting time once the operation has been completed.

Slat correction

The KNX function of the "Venetian blind/ positioning" supports the supplementary function of the slat correction. Many KNX shutter actuators track the slat position when the shutter height changes due to a position setting. These actuators also reposition the slats when the blind position is preset to 0%, i.e. to the upper end position. This repositioning of the slats is often undesirable in the upper end position of the Venetian blind since the returned blind height also changes again due to the movement of the slats (position of blind unequal 0%). To prevent the slat from being repositioned in the upper blind end position, the automatic slat correction can be activated in the KNX function "Venetian blind/ positioning". It can be activated by parameter in the configuration software.

If the slat correction has been activated, the device always transmits a slat position of 0% for a blind height presetting of 0%. As a result, the slat is not repositioned when the upper end position is reached since this is already in the 0% position after the upward movement. It does not matter which operation performs the 0% presetting. Consequently, the slat correction will only function after short or long operations of the sensor surfaces or when changing the slider if a 0% blind position is set.

The automatic slat correction does not apply to position presettings for the blind within the range 1...100%. In such cases, the device only transmits slat positions when a slat operation is performed using the sensor surfaces or the slider.

4.2.4.3.8 Operating and display function "Rolling shutter Step / Move"

1-bit switching telegrams in compliance with the KNX data point types 1.007 (Step) and 1.008 (UpDown) can be transmitted to the bus by using the KNX function "Rolling shutter Step / Move". In this way, it is possible to activate rolling shutters by means of short time and long time telegrams in combination with appropriate actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.
The difference between the KNX function "Venetian blind Step /Move/Step" basically lies in the fact that in order to simplify the control and display, no slat functions are available in the rolling shutter shading method, which is why the slat adjusting time, among other things, is omitted.

The sensor element distinguishes between short and long operations. Depending on this, different telegrams are transmitted to the bus...

- Immediately on pressing a sensor surface the device transmits a short time telegram to the bus (figure 29), whereupon a running drive is stopped and the "time between short and long time operation" T1 is started internally. If the pressed sensor element is released again within T 1, the device transmits no further telegram. This short time serves the purpose of stopping a continuous movement.
  The "time between short and long time operation" is configured in the configuration software and should be selected shorter than the short time operation of the actuator to avoid any jerky movement of the activated drive.
- If the sensor element is kept depressed longer than T1, the device transmits a long time telegram after the end of T1 for starting up the drive.
- On releasing the sensor element, no further reaction takes place. The drive remains on until the end position is reached.

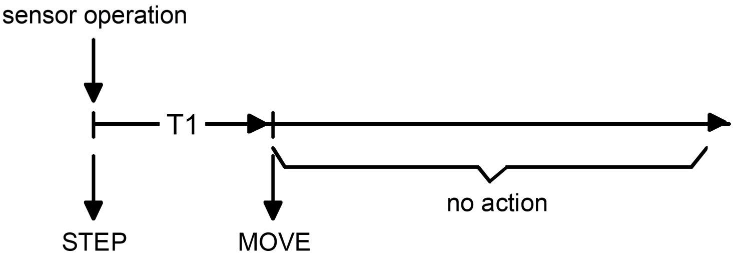


Figure 29: Telegram concept when a sensor surface of the channel function is touched "Rolling shutter Step/Move"

A KNX function "Rolling shutter Step/Move" for switching has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation).

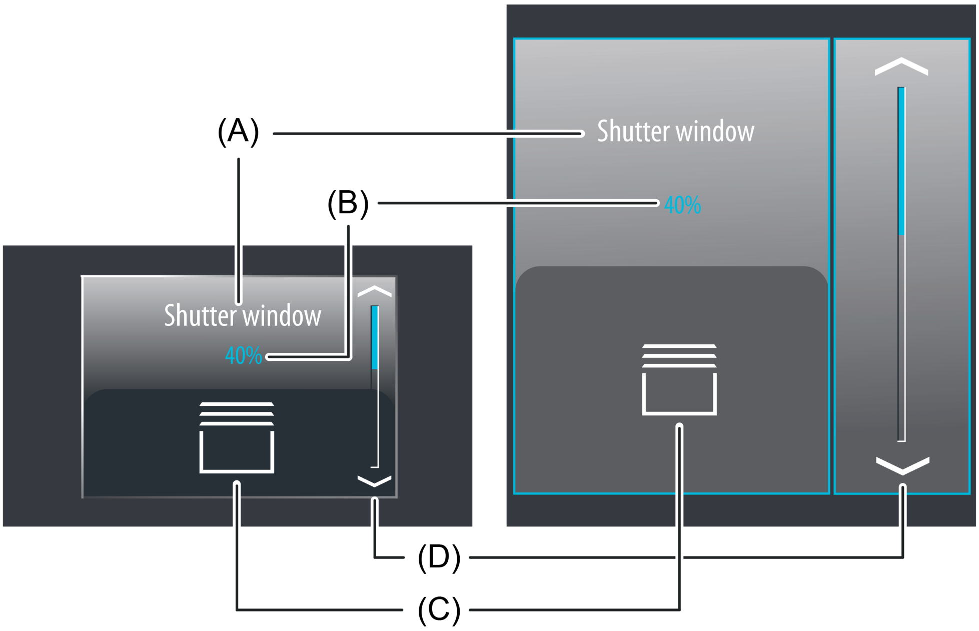


Figure 30: Example of an operating and display element of the function "Rolling shutter Step/Move"
left: direct operation / right: selection operation

(A) Text name
(B) Status value
(C) Status icon blind (configurable)
(D) Bar graph in the sensor area

ℹ The function "Rolling shutter Step/Move" can be executed as a rocker or push-button function depending on the parameterisation. The figure shows the rocker configuration as an example.

Status elements

The display area contains different display elements (figure 30) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "Rolling shutter window"). In addition, a status value (B) can be displayed below the name, which displays position values in plain text ("0...100 %") depending on the object value of the position feedback of the Venetian blind or shutter actuator addressed. After a device reset, the display shows "---%" until a feedback object value of the status text is received.
Similarly to the status value, a symbol can be displayed in the lower display area for the blind/shutter (C). The displayed icon can be defined in the configuration software whereby an adjustment to the type of hanging (rolling shutter, awning, vertical slat, roof window) is possible. The character of the status icon changes depending on the position thereby enabling the current blind/shutter position of the activated KNX function to be read clearly. The status value and icon can be omitted optionally.

In the channel function "Rolling shutter Step/Move", a bar graph (D) is displayed in the sensor element. The bar graph displays position values in graphical form based on the position feedback of the Venetian blind or rolling shutter actuator. The bar graph always displays the blind/shutter position.
In the shutter/blind control, the bar graph falls from the top to the bottom when the position of the activated shading system becomes greater. Similarly, the bar graph rises when the position becomes less. At full-scale deflection of the bar graph, the maximum shutter/blind position has been reached. If the bar graph does not show any deflection, the shutter/blind is completely

retracted.
The bar graph is visible when a feedback object is used and the value is to be displayed and normally supplements the status indication by status value and status icon.

Objects

The KNX function "Rolling shutter Step/Move" has up to 3 KNX communication objects...

- "Short-time operation" (1-bit transmitting):
  Short time telegrams are transmitted to the bus via this object after a short touch of the sensor element. This causes any ongoing drive runs to be stopped. Alternatively, blinds/shutters or slats are activated briefly since the drive is being activated from the "Stop" state. KNX blind or shutter actuators then execute the configured short-time operation (Step).

- "Long-time operation" (1-bit transmitting):
  Long time telegrams (up, down) are transmitted to the bus via this object after a long press of the sensor element. This enables activated blinds/shutters of shading systems to be controlled until the end positions. KNX blind or shutter actuators additionally execute the configured long-time operation (Move).
  A short time telegram (see object "Short-time object") can interrupt ongoing drive runs of the long time operation (Stop) thereby enabling a blind/shutter to be stopped at any desired point.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value, status icon and also the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind or shutter actuator does not have a feedback for the blind/shutter position, the parameter "Use feedback object" can be deselected whereby all the status indications are then no longer available either, however.

ℹ The object "Rolling shutter feedback" interprets received values on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 % and displayed in the device display.

ℹ Since Venetian blind or shutter actuators normally transmit position values as feedback, the activated motors stop when driver runs have been completed. For this reason, status indications of the function element concerned do not normally change during a press of the sensor surface, but only when the buttons are released and the drive runs are stopped. By contrast, a displayed status value can already change even during an operation if the drive is already in the end position or cannot pass through the entire position range due to disabling functions.

4.2.4.3.9 Operating and display function "Rolling shutter positioning"

With the function "rolling shutter positioning" it is possible to transmit 1-byte position telegrams (values in compliance with KNX DPT 5.001 Scaling) to the bus. In this way, it is possible to activate rolling shutters by means of position values in combination with Venetian blind or shutter actuators. Similarly, other shading systems, such as roof windows, vertical slats and awnings can also be controlled by individual characteristics of the status indicators.
The difference between the functions "Rolling shutter Step/Move" and "Rolling shutter positioning" lies in the data formats of the communication objects. In addition, the difference between the KNX function "Venetian blind positioning" basically lies in the fact that in order to simplify the control and display, no slat functions are available in the rolling shutter shading method.

A KNX function "Rolling shutter positioning" for switching has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a rocker function and distinguishes between short and long operations.
A short sensor operation, depending on the operated sensor surface ︿ / ﹀, triggers value telegrams "100 %" or "0 %". In this way, the activated blind/shutter can be moved to the end position. Position value telegrams are transmitted to the bus gradually in a defined time interval by means of long operations of the sensor surfaces. The device then increases or decreases the value cyclically during the operation depending on the specified value transmitter level of 10 % and transmits the values as a position setting. The value sequence generated in this way is converted to a movement by the activated Venetian blind or shutter actuator. The time between two value telegrams is preset to 600 ms. The travelling time of the actuator channel must be adjusted to this time in order to attain a constant and interruption-free movement operation. The time for short and long operations can be adjusted in the configuration software.

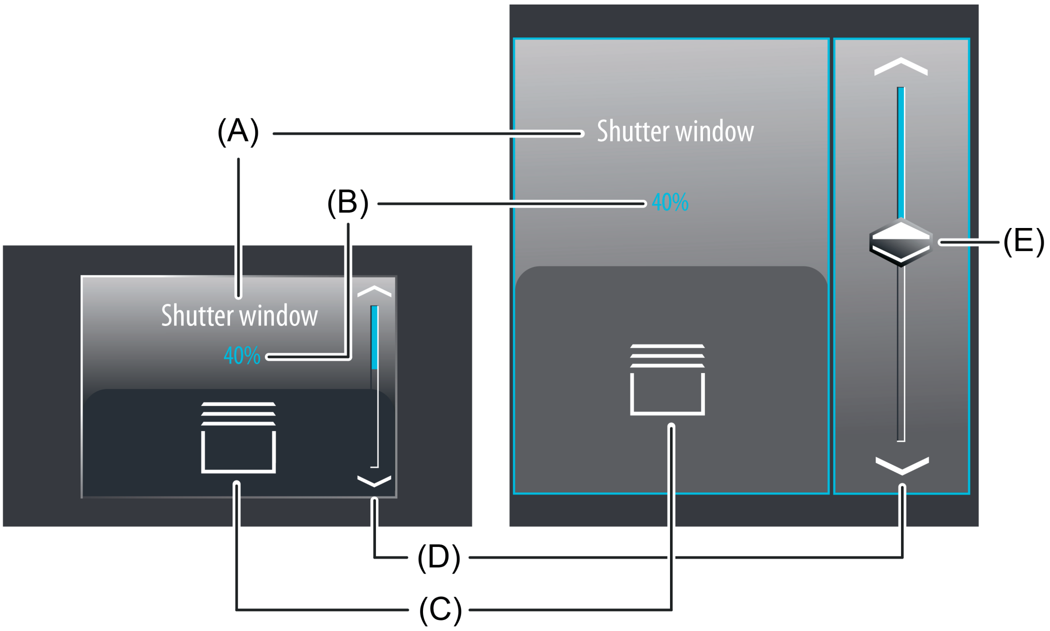


Figure 31: Example of an operating and display element of the function "Rolling shutter positioning"
left: direct operation / right: selection operation

(A) Text name
(B) Status value
(C) Status icon (configurable)
(D) Bar graph in the sensor area

(E) Slider in the sensor area

Slider

In the selection operation, a slider (E) is also available in addition to the sensor surfaces ⌃ / ⌄ for positioning in the end positions or for value (figure 31). It is possible to specify positions for blind/shutter heights directly with graphic support using the slider. For this purpose, the slider can be set by finger pressure or continuously moved. To set the slider, you must touch the slider area at the required position with your finger. The slider then jumps immediately to the required position. At the same time, the device transmits the position value specified thus as a setting to the bus.
Alternatively, you can move the slider continuously in the slider area with your finger. During the movement of the slider, the device transmits values according to the specified value transmitter level of 10 % time-controlled and gradually. As a result, the blind/shutter position of the activated system already changes during the slider adjustment, for example, whereby in the ideal case the operator immediately receives a visual feedback on the drive movement and position. The time that must elapse before the device outputs a new position level during an adjustment is preset to 600 ms. Thus, the time of the value adjustment and the value transmitter level affect the control speed of the slider.

ⓘ The current position of the blind/shutter is indicated in the sensor element as a bar graph (see Functional description of the display elements below). The slider is located graphically before the bar graph and is adapted to the position of the bar graph if no slider operation occurs. Thus, the slider responds to the feedback telegrams of the Venetian blind or shutter actuator or alternatively to the preset value by operation similarly to the bar graph.
It is generally recommended to move the slider as slowly as possible and to leave your finger briefly (approx. 1s) on the operating element after reaching the setpoint so that the status indicator in the bar graph matches the current slider position and ideally no position correction takes place at the end of the operation.

ⓘ It should be noted that for a direct operation no slider is available for continuously changing the value! Here, a value can be adjusted to the specified value transmitter level (10 %) by means of a long top-bottom operation of the sensor surfaces.

Status elements

The display area contains different display elements (figure 31) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "Rolling shutter window"). In addition, a status value (B) for the blind/shutter height can be displayed below the name, which either displays position values in plain text ("0...100 %") depending on the object value of the position feedback of the Venetian blind or rolling shutter actuator addressed or alternatively directly depending on the preset position value of the operating element. After a device reset, the display shows "---%" until a feedback object value of the status text is received or a position value is specified.
Similarly to the status value, a symbol (C) can be displayed in the lower display area. The displayed icon for the blind/shutter height can be defined in the configuration software whereby an adjustment to the type of hanging (rolling shutter, awning, vertical slat, roof window) is possible. The character of the status icon changes depending on the position thereby enabling the current position of the activated KNX function to be read clearly. The status value and icon can be omitted optionally.

In the function "Rolling shutter positioning", a bar graph (D) is displayed in the sensor element. The bar graph displays position values in graphical form based on the position feedback of the Venetian blind actuator or rolling shutter actuator addressed or alternatively based on the preset value by operation.
In the shutter/blind control, the bar graph falls from the top to the bottom when the position of the activated shading system becomes greater. Similarly, the bar graph rises when the position becomes less. At full-scale deflection of the bar graph, the maximum shutter/blind position has been reached. If the bar graph does not show any deflection, the shutter/blind is completely

retracted.
The bar graphs is always visible and normally supplements the status indication by status value and status icon. The bar graph is located graphically behind the slider.

Keyboard for entering values

In addition to the possibilities of specifying position values using the sensor surfaces ⌃ / ⌄ or slider, a keyboard can optionally be shown in the display. It is possible to specify a position value directly using the keyboard. The keyboard becomes visible by pressing a display area of the status icon or status value for a long time with your finger (approx. 1s) if this was enabled by parameter configuration in the configuration software. Using the keyboard, any position value ranging from 0...100% can be entered numerically and applied by pressing the ✓ button. After applying the value, it is accepted as a preset value and transmitted to the bus.
The entry can be terminated without applying any value by touching the sensor surface **x** in the keyboard.

ℹ It is only possible to preset a position value via the keyboard in selection operation on the room or function pages.

Objects

The KNX function "Rolling shutter positioning" has up to 2 KNX communication objects...

- "Roller shutter position" (1-bit transmitting and optional receiving):
  Value telegrams (0...255) for the blind/shutter height setting are transmitted to the bus via this object after pressing the sensor elements. This can cause a blind position object (e.g. "Position rolling shutter", "Position rolling shutter/awning", "Position venting louver"...) of a blind or shutter actuator to be activated.
  If the parameter "Use feedback object" is not selected, the position value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX Venetian blind or shutter actuator does not have any separate feedback objects for the blind/shutter position.

- "Feedback blind/shutter position" (1-byte receiving):
  Through this object the device can receive a position feedback for the blind/shutter height that a shutter actuator transmits, for example. The status value, status icon and also the bar graph for the blind/shutter height visualisation are influenced as a result. The feedback of the position value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX Venetian blind or shutter actuator does not have a separate status feedback for the blind/shutter height, the parameter "Use feedback object" can be deselected whereby the blind/shutter status indications are activated via the object "Rolling shutter position".

ℹ The objects interpret values to be sent or received on the basis of the KNX data point type 5.001 (Scaling). The decimal data values 0...255 are evaluated as percentages 0...100 %.

ℹ During an operation, the value of the object "Rolling shutter position feedback" is not evaluated. With a long press of the sensor elements ⌃ / ⌄ or when moving the slider, a continuous value adjustment can take place on the bus. During this value adjustment, all status elements of the function element are updated continuously by value simulation. The display elements first react again to the feedback object value of the Venetian blind or shutter actuator after a short waiting time once the operation has been completed.

4.2.4.3.10 Operating and display function "Value transmitter"

With the KNX function "Value transmitter" telegrams in compliance with various KNX 1-byte, 2-byte and 4-byte data types can be transmitted to the bus. The activation of other bus devices enables the user with the 1-byte data formats, for example, to execute limiting value presettings or presettings for current counter statuses. With the 2-byte and 4-byte data formats it is possible to specify temperature or brightness values or to generate any preset values for other physical sizes with negative or positive signs.
Since the 1-byte data format is identical, it is also possible as an alternative or supplement to the channel function "Dimming brightness value" or "Venetian blind/rolling shutter positioning" to activate dimmer actuators more easily (via brightness value specification) or blind and shutter actuators (via position value specifications). Here - as an example - static brightness or position values can be configured and recalled by sensor surface operation. Such an operation is appropriate when slider, value adjustment by a long button-press or visualizations of slat positions are not required. The character of the status icons support such use of the channels and make it possible to adapt to the activated KNX actuator.

The function "Value transmitter" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a push-button function and does not distinguish between any short and long operations.
A sensor operation triggers the value telegram defined in the configuration software (transmission value). The parameter "data point type" determines the data format of the value transmitter object. In addition, the "display format" can also be determined which - depending on the set data point type - can also be characterised user-defined (gain and offset, value unit). The scaling of the status indications also adapts itself depending on this setting. The parameter "Format" also makes it possible to adapt the amount of visible and adjustable digits before and after the decimal point (if present).

The table below shows the configurable data types and the resulting value ranges and possible value units specified...

Data type	Display format	Value range	Value unit
1-byte (5.001...5.004)	Percent (%)	0...100	% (specified)
1-byte (5.001...5.004)	Degrees (°)	0...360	° (specified)
1-byte (5.001...5.004)	user-defined	0...255	user-defined
1-byte (5.010)	user-defined	0...255	user-defined
1-byte (6.010)	user-defined	-128...127	user-defined
2-byte (7.001)	user-defined	0...65535	user-defined
2-byte (8.001)	user-defined	-32768...32767	user-defined
2-byte (9.001...9.021)	user-defined	-671089...670761	user-defined
4-byte (12.001)	user-defined	0...4294967295	user-defined
4-byte (13.001)	user-defined	-2147483648...2147483647	user-defined
4-byte (14.000...14.079)	user-defined	-214748365...214748365	user-defined

Configurable data types, value ranges and value units

i The value transmitted via the communication object of the value transmitter can vary from the preset value during a sensor surface operation (presetting via transmission value in the configuration software or keyboard) because a gain factor and value offset can be configured optionally with some data types (see "Objects" below).

In addition to recalling values by operation of the sensor surface, it is possible to use a keyboard for presetting the value (see page 95-96). As a result, it is possible optionally to permanently change the value that was originally preset in the ETS and thus to adapt it at any time.

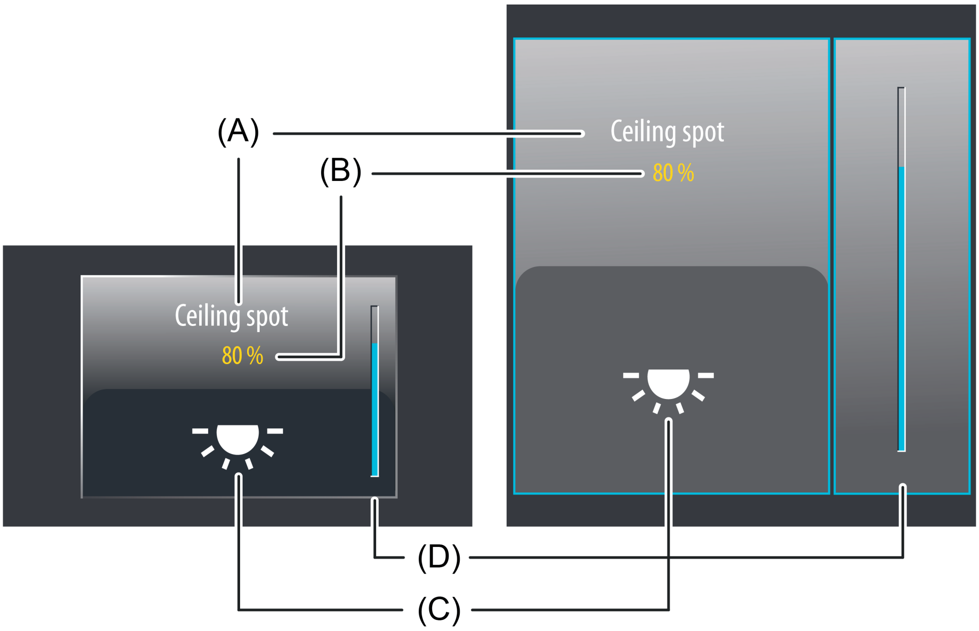

(A)
(B)
Ceiling spot
80 %
Ceiling spot
80 %
(D)
(C)

Figure 32: Example of an operating and display element of the function "Value transmitter" with a data format "1-byte 5.001...5.004"
left: direct operation / right: selection operation

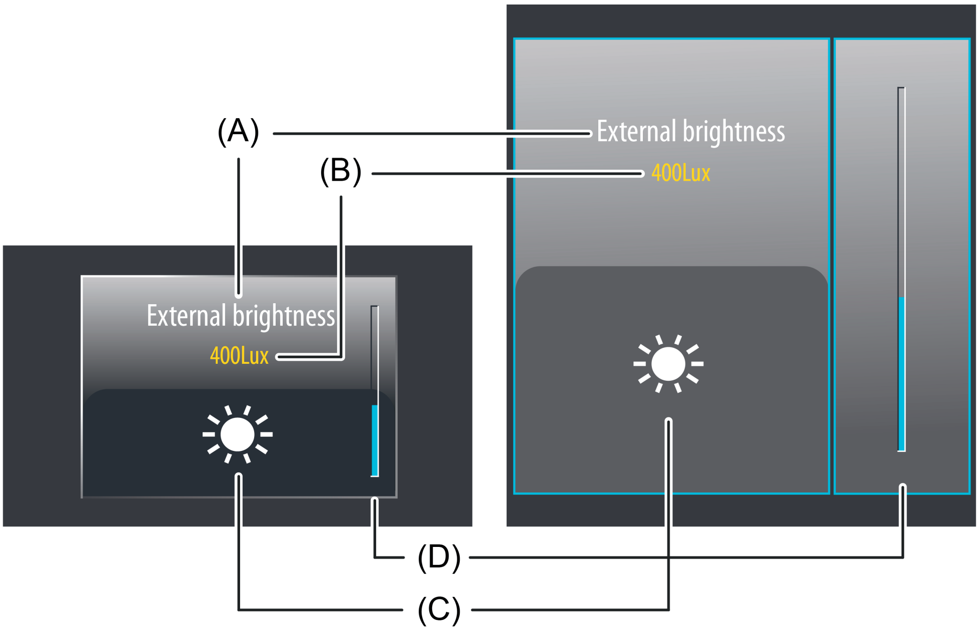

(A)
(B)
External brightness
400Lux
External brightness
400Lux
(D)
(C)

Figure 33: Example of an operating and display element of the function "Value transmitter" with a data format "2-byte 9.001...9.021"
left: direct operation / right: selection operation

(A) Text name
(B) Status value

(C) Status icon (configurable)

(D) Bar graph in the sensor area

With the function "Value transmitter", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned only works as a display function for value visualisation. Consequently, touching the sensor or display elements does not induce any response.

Status elements

The display area contains different display elements (figure 32) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "ceiling spot", "external brightness"). In addition, a status value (B) can be displayed below the name, which either displays values in plain text ("0...255", "0...100%", "0...65535 lux") depending on the object value of the value feedback of an actuator or alternatively directly depending on the preset value of the operating element. The data format of this status value display is determined by the data type set in the configuration software and by the parameterised display format. After a device reset, the display shows "---" (supplemented by the unit) until a feedback object value of the status text is received or a value is specified.
Similarly to the status value, a symbol (C) can be displayed in the lower display area. The icon displayed is defined in the configuration software. The character of the status icon changes with the dynamic icons depending on the feedback value thereby enabling the value status (e.g. brightness value or blind/shutter position) of the activated KNX function to be read clearly. Other icons not identified as dynamic behave statically and do not change their character depending on the received or preset values.
The status value and icon are hidden by default since value transmitters are often only used to transmit value commands to the bus without additional visualisation. If you wish to display a status value and icon, the parameter "Display value" must be set in the configuration software.

In the function "Value transmitter", a bar graph (D) is displayed in the sensor element. The bar graph displays values in graphical form based on the value feedback or alternatively based on the preset value by operation. The bar graph rises when the value becomes greater. Similarly, the bar graph falls when the value becomes less. The parameters "Minimum value" and "Maximum value" scale the bar graph and thus define the minimum and maximum displayable value. At full-scale deflection, the maximum value for the value range is set. If the bar graph shows no deflection, the minimum value is set.
The bar graph is visible when the value is to be displayed and normally supplements the status indication by status value and status icon.

With the function "Value transmitter", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned only works as a display function for value visualisation. Consequently, touching the sensor or display elements does not induce any response.

Keyboard for entering values

In addition to the possibility of recalling values via the sensor surface and thus transmitting them to the bus, a keyboard can optionally be shown in the display. It is possible to specify a value directly using the keyboard and thus to permanently vary from the value defined in the configuration software. The keyboard becomes visible by pressing the status icon or status value for a long time with your finger (approx. 1s) if this was enabled by parameter configuration in the configuration software. Using the keyboard, a value can be entered numerically and applied by pressing the ✓ button. After applying the value, it is transmitted to the bus and saved permanently in the device memory. Only a programming operation resets the value to the original parameter configuration. It should be noted that only values within the "Minimum value" and "Maximum value" limits defined by the ETS parameters can be entered.
The entry can be terminated without transmitting any value by touching the sensor surface **x** in the keyboard.

- ⓘ The value transmitted via the communication object of the function can vary from the preset value via the keyboard because a gain factor and value offset can be configured optionally (see "Objects" below).
- ⓘ The parameter "Format" influences the value entered via the keyboard. The parameter specifies how many numbers can be preset before and after the decimal point via the keyboard and thus defines the value range that can be preset in this way.
- ⓘ It is only possible to specify a value via the keyboard in selection operation on the room or function pages.

Objects

The function "Value transmitter" has up to 2 KNX communication objects...

- "Value" (transmitting and optional receiving):
  Value telegrams are transmitted to the bus via this object after pressing the sensor element. This can cause, for example, a limiting value object, brightness value object or blind position object to be activated.
  If the parameter "Use feedback object" is not selected, the value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX device does not have any separate value feedback objects.

- "Feedback value" (receiving):
  Through this object the device can receive a value feedback that an activated actuator transmits, for example. The status value, status icon and bar graph for the value visualisation are influenced as a result. The feedback of the value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX actuator does not have a separate status feedback, the parameter "Use value feedback object" can be deselected whereby the status indications are activated via the object "Value".

ⓘ The status elements of the function are influenced by the objects "Value" or "Feedback value". In addition, a value recall by sensor operation or by entry via keyboard also influences the status elements. During a value recall, the status elements are updated according to the recalled value regardless of the current feedback value. The display elements first react again to the returned object value from the addressed device after a value recall by operation. As a result, this may cause a leap in value in the status indication when returned values vary from the preset value.

i The gain factor and value offset can optionally be configured in the configuration software. Before a value is transmitted to the bus via the object "Value" during an operation, the device calculates the value to be transmitted based on the gain factor and value offset. The same applies to the value display. The value received from the bus via the object "Value" or "Feedback value" is influenced - in the opposite way than during transmission - by the gain factor and value offset and only displayed afterwards.
As a general rule: "$\text{Value}_{\text{Display/Operation}}$ = $\text{Value}_{\text{Bus}}$ x Gain + Offset"
or
"$\text{Value}_{\text{Bus}}$ = ($\text{Value}_{\text{Display/Operation}}$ - Offset) : Gain".

Example (Conversion $°\text{C}_{\text{Bus}}$ -> $°\text{F}_{\text{Display/Operation}}$)...
Gain: "1.8" / Offset: "+32" ->
Transmitting: During an operation, the value "77°F" is preset by the user. -> The value "25°C" is transmitted to the bus ((77 - 32 [Offset]) : 1.8 [Gain] = 25).
Receiving: The value "20°C" is received via the bus. -> The value "68°F" is displayed in the display (20 x 1.8 [Gain] + 32 [Offset] = 68).

Gain factors can be smaller or greater than 1. Offsets can be negative and positive.
If a greater or smaller value than the value range limits should result in purely mathematical terms due to the value conversion by gain and offset, the device adapts the converted values to the maximum or minimum possible limiting value range.

4.2.4.3.11 Operating and display function "Value transmitter adjustment function"

With the KNX function "Value transmitter adjustment function" telegrams in compliance with various KNX 1-byte, 2-byte and 4-byte data types can be transmitted to the bus. The difference between the function "Value transmitter" (without adjustment function) lies in the fact that the value to be transmitted in the case of "Value transmitter adjustment function" can be adjusted continuously by a long button-press or by a value slider. The operation is comparable with the functions "Dimming brightness value" and "Venetian blind/rolling shutter positioning", the difference being that in the case of the value transmitter not just 1-byte data formats can be operated.

The function "Value transmitter adjustment function" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a rocker function and distinguishes between short and long operations.
The parameter "data point type" determines the data format of the value transmitter object. In addition, the "display format" can also be determined which - depending on the set data point type - can also be characterised user-defined (gain and offset, value unit). The scaling of the status indications also adapts itself depending on this setting. The parameter "Format" also makes it possible to adapt the amount of visible and adjustable digits before and after the decimal point (if present).

Every short operation of the sensor surfaces **+** or **-** triggers a value telegram in each case. Starting from the value of the last adjustment, the transmission value is increased or decreased by the configured "initial increment". An adjustment is possible until the range limits defined by the parameters "minimum value" and "maximum value".
Value telegrams are transmitted to the bus (value adjustment) gradually in a defined time interval by means of a long operation of the sensor surfaces **+** or **-**. The device then increases or decreases the value cyclically during the operation by the defined value transmitter levels and transmits the values to the bus. The initial transmitter level (increment immediately after the operation) can be configured by the parameter "initial increment". In the case of a value adjustment by a long button-press, the device first increases or decreases the value based on the initial increment. If the value adjustment lasts longer, the device increases the increment automatically so that the interval of the transmitted values becomes greater. Consequently, setpoints are reached faster.
The time between two value telegrams can be set. The time for short and long operations can also be adjusted in the configuration software.

The table below shows the configurable data types and the resulting value ranges and possible value units specified...

Data type	Display format	Value range	Value unit
1-byte (5.001...5.004)	Percent (%)	0...100	% (specified)
1-byte (5.001...5.004)	Degrees (°)	0...360	° (specified)
1-byte (5.001...5.004)	user-defined	0...255	user-defined
1-byte (5.010)	user-defined	0...255	user-defined
1-byte (6.010)	user-defined	-128...127	user-defined
2-byte (7.001)	user-defined	0...65535	user-defined
2-byte (8.001)	user-defined	-32768...32767	user-defined
2-byte (9.001...9.021)	user-defined	-671089...670761	user-defined
4-byte (12.001)	user-defined	0...4294967295	user-defined
4-byte (13.001)	user-defined	-2147483648...2147483647	user-defined
4-byte (14.000...14.079)	user-defined	-214748365...214748365	user-defined

Configurable data types, value ranges and value units ℹ The value transmitted via the communication object of the value transmitter can vary from the preset value during a sensor surface operation because a gain factor and value offset can be configured optionally with some data types (see "Objects" below).

In addition to recalling values by operation of the sensor surface, it is possible to use a keyboard for presetting the value (see page 101-102). Thus, it is optionally possible to change the transmission value regardless of the value transmitter levels.

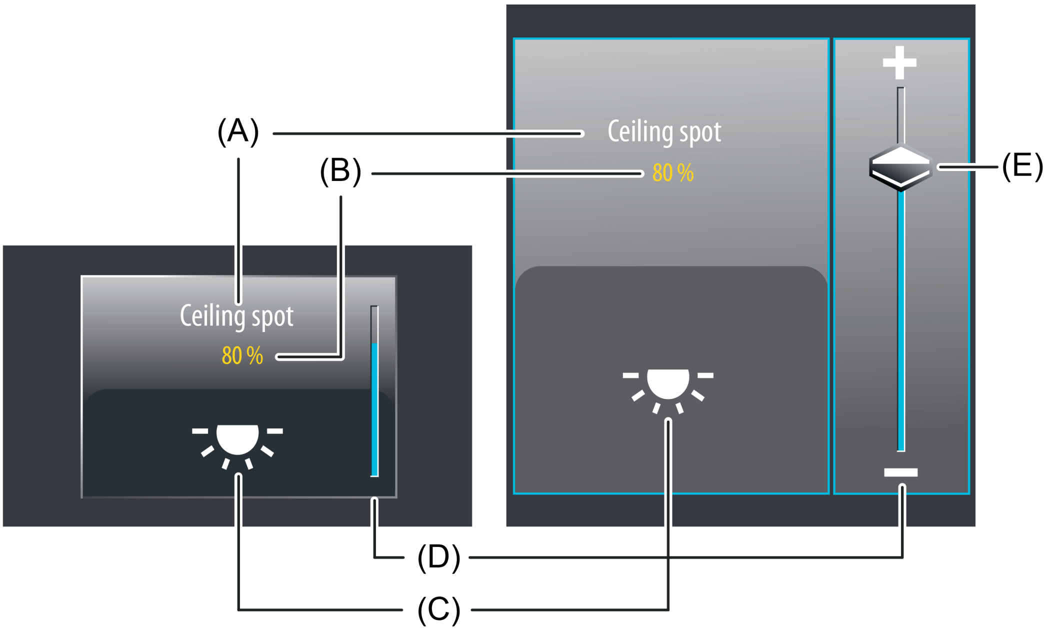


Figure 34: Example of an operating and display element of the function "Value transmitter adjustment function" with a data format "1-byte 5.001...5.004"
left: direct operation / right: selection operation

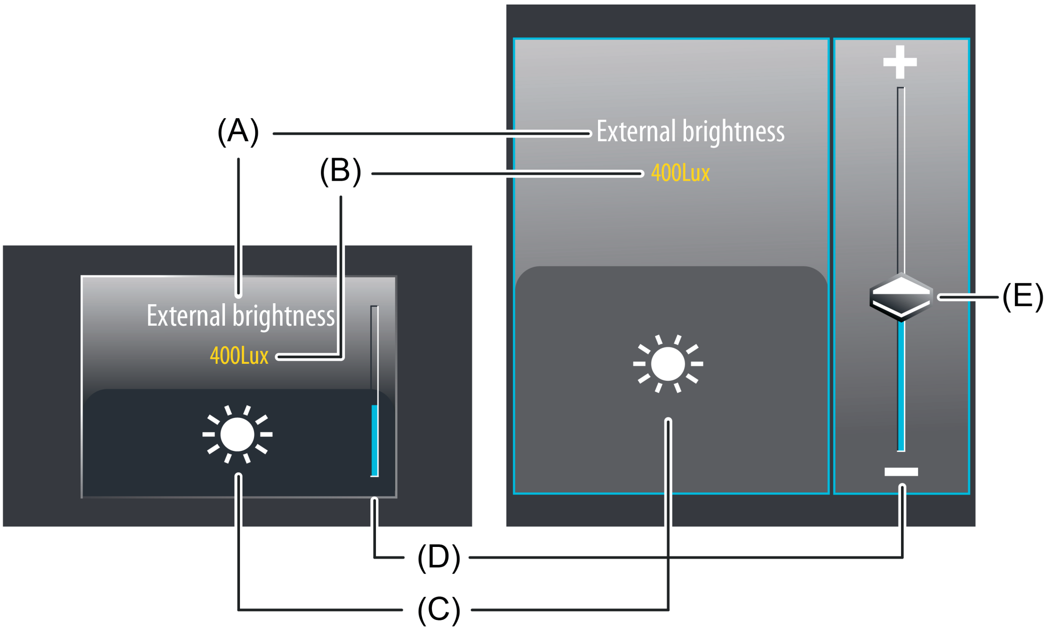


Figure 35: Example of an operating and display element of the function "Value transmitter adjustment function" with a data format "2-byte 9.001...9.021"
left: direct operation / right: selection operation

(A) Text name
(B) Status value
(C) Status icon (configurable)
(D) Bar graph in the sensor area
(E) Slider in the sensor area

With the function "Value transmitter adjustment function", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned only works as a display function for value visualisation. Consequently, touching the sensor or display elements does not induce any response.

Slider

In the selection operation, a slider (E) is available in addition to the sensor surfaces **+** or **-** for discrete value presetting (figure 34). It is possible to specify values directly with graphic support using the slider. For this purpose, the slider can be set by finger pressure or continuously moved. To set the slider, you must touch the slider area at the required value gradation with your finger. The slider then jumps immediately to the required position. At the same time, the device transmits the value specified thus as a setting to the bus.
Alternatively, you can move the slider continuously in the slider area with your finger. During the movement of the slider, the device transmits values continuously. As a result, the brightness of the activated lighting already changes, for example, during the slider adjustment whereby the operator immediately receives a visual brightness feedback. The time that must elapse before the device outputs a new brightness level as a telegram during an adjustment is preset to 500 ms.

ⓘ The current value is indicated in the sensor element as a bar graph (see Functional description of the display elements below). The slider is located graphically before the bar graph and is adapted to the position of the bar graph if no slider operation occurs. Therefore, the slider responds to the feedback telegrams of the activated actuator or alternatively to the preset value by operation similarly to the bar graph.
It is generally recommended to move the slider as slowly as possible and to leave your finger briefly (approx. 1s) on the operating element after reaching the setpoint so that the status indicator in the bar graph matches the current slider position and ideally no value correction takes place at the end of the operation.

ⓘ It should be noted that for a direct operation no slider is available for continuously changing the value! Here, a value can be adjusted to value transmitter levels by means of a long top-bottom operation of the sensor surfaces.

Status elements

The display area contains different display elements (figure 34) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "ceiling spot", "external brightness"). In addition, a status value (B) can be displayed below the name, which either displays values in plain text ("0...255", "0...100%", "0...65535 lux") depending on the object value of the value feedback of an actuator or alternatively directly depending on the preset value of the operating element. The data format of this status value display is determined by the data type set in the configuration software and by the parameterised display format. After a device reset, the display shows "---" (supplemented by the unit) until a feedback object value of the status text is received or a value is specified. Similarly to the status value, a symbol (C) can be displayed in the lower display area. The icon displayed is defined in the configuration software. The character of the status icon changes with the dynamic icons depending on the feedback value thereby enabling the value status (e.g. brightness value or blind/shutter position) of the activated KNX function to be read clearly. Other icons not identified as dynamic behave statically and do not change their character depending on the received or preset values.
The status value and icon can be omitted optionally.

In the function "Value transmitter adjustment function", a bar graph (D) is displayed in the sensor element. The bar graph displays values in graphical form based on the value feedback or alternatively based on the preset value by operation. The bar graph rises when the value becomes greater. Similarly, the bar graph falls when the value becomes less. The parameters "Minimum value" and "Maximum value" scale the bar graph and thus define the minimum and maximum displayable value. At full-scale deflection, the maximum value for the value range is set. If the bar graph shows no deflection, the minimum value is set.
The bar graph is visible when the value is to be displayed and normally supplements the status indication by status value and status icon.

With the function "Value transmitter adjustment function", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned only works as a display function for value visualisation. Consequently, touching the sensor or display elements does not induce any response.

Keyboard for entering values

In addition to the possibility of recalling values via the sensor surface and thus transmitting them to the bus, a keyboard can optionally be shown in the display. It is also possible to specify a value directly using the keyboard without a long-press of the sensor surface. The keyboard becomes visible by pressing the status icon or status value for a long time with your finger (approx. 1s) if this was enabled by parameter configuration in the configuration software. Using the keyboard, a value can be entered numerically and applied by pressing the ✓ button. After applying the value, it is transmitted to the bus and saved permanently in the device memory. Only a programming operation resets the value to "0". It should be noted that only values within the "Minimum value" and "Maximum value" limits defined by the ETS parameters can be

entered.
The entry can be terminated without transmitting any value by touching the sensor surface **x** in the keyboard.

ℹ The value transmitted via the communication object of the function can vary from the preset value via the keyboard because a gain factor and value offset can be configured optionally (see "Objects" below).

ℹ The parameter "Format" influences the value entered via the keyboard. The parameter specifies how many numbers can be preset before and after the decimal point via the keyboard and thus defines the value range that can be preset in this way.

ℹ It is only possible to specify a value via the keyboard in selection operation on the room or function pages.

Objects

The KNX function "Value transmitter adjustment function" has up to 2 KNX communication objects...

- "Value" (transmitting and optional receiving):
  Value telegrams are transmitted to the bus via this object after pressing the sensor element. This can cause, for example, a limiting value object, brightness value object or blind position object to be activated.
  If the parameter "Use feedback object" is not selected, the value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX device does not have any separate value feedback objects.

- "Feedback value" (receiving):
  Through this object the device can receive a value feedback that an activated actuator transmits, for example. The status value, status icon and bar graph for the value visualisation are influenced as a result. The feedback of the value must be transmitted by the "actively transmitting" actuator.
  If the activated KNX actuator does not have a separate status feedback, the parameter "Use value feedback object" can be deselected whereby the status indications are activated via the object "Value".

ℹ The status elements of the function are influenced by the objects "Value" or "Feedback value". In addition, a value recall by sensor operation or by entry via keyboard also influences the status elements. During a value recall, the status elements are updated according to the recalled value regardless of the current feedback value. The display elements first react again to the returned object value from the addressed device after a value recall by operation. As a result, this may cause a leap in value in the status indication when returned values vary from the preset value.

i The gain factor and value offset can optionally be configured in the configuration software. Before a value is transmitted to the bus via the object "Value" during an operation, the device calculates the value to be transmitted based on the gain factor and value offset. The same applies to the value display. The value received from the bus via the object "Value" or "Feedback value" is influenced - in the opposite way than during transmission - by the gain factor and value offset and only displayed afterwards.
As a general rule: "$\text{Value}_{\text{Display/Operation}}$ = $\text{Value}_{\text{Bus}}$ x Gain + Offset"
or
"$\text{Value}_{\text{Bus}}$ = ($\text{Value}_{\text{Display/Operation}}$ - Offset) : Gain".

Example (Conversion $°\text{C}_{\text{Bus}}$ -> $°\text{F}_{\text{Display/Operation}}$)...
Gain: "1.8" / Offset: "+32" ->
Transmitting: During an operation, the value "77°F" is preset by the user. -> The value "25°C" is transmitted to the bus ((77 - 32 [Offset]) : 1.8 [Gain] = 25).
Receiving: The value "20°C" is received via the bus. -> The value "68°F" is displayed in the display (20 x 1.8 [Gain] + 32 [Offset] = 68).

Gain factors can be smaller or greater than 1. Offsets can be negative and positive.
If a greater or smaller value than the value range limits should result in purely mathematical terms due to the value conversion by gain and offset, the device adapts the converted values to the maximum or minimum possible limiting value range.

4.2.4.3.12 Operating and display function "Scene recall"

With the KNX function "Scene recall" it is possible to recall one of the scenes stored internally in the device. In this way, it is possible to control different KNX function units and thus, for example, to set lighting and shading systems in combination with the device's own scene function depending on the situation.
The function "Scene recall" is always executed as a push-button function. No distinction is made between short and long operations.

No telegram is transmitted to the bus via the operating and display function during the recall of an internal scene. Consequently, the function does not have its own communication objects. Only the internal scene function is activated.
The parameter "scene" specifies which of the internal scenes is to be recalled during an operation. In this parameter, a selection can first take place after at least one scene has been stored in the configuration software in the parameter branch "Scenes".

ℹ It is not possible to change and save internal scenes via the function "Scene recall". For this purpose, the scene page (Symbol " ⚙") is provided in the function view, where - if this was enabled in the configuration software - value or switching commands of a scene can be changed.

The function "Scene recall" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation).

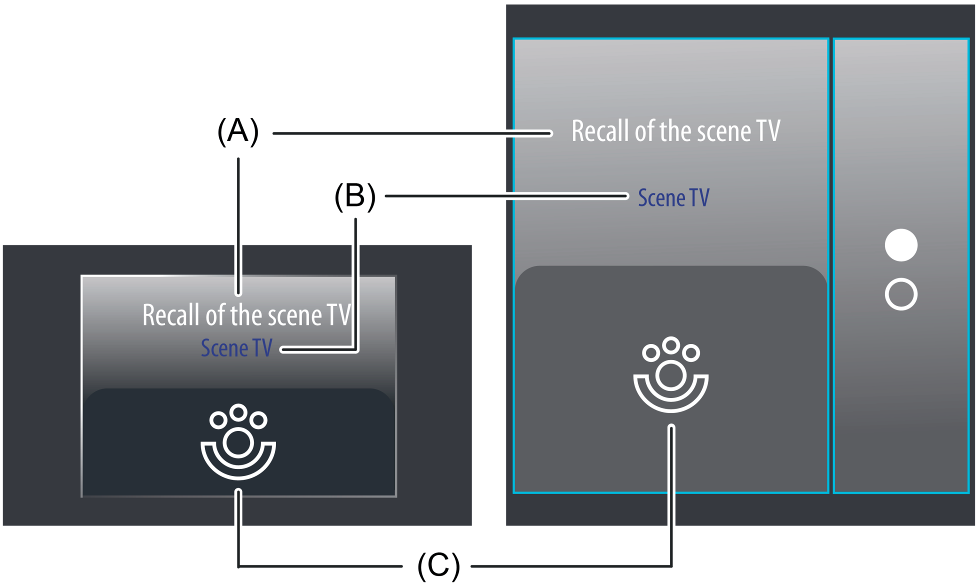


Figure 36: Example of an operating and display element of the function "Scene recall"
left: direct operation / right: selection operation

(A) Text name
(B) Status text (name of the scene)
(C) Status icon (static)

ⓘ With the function "Scene recall", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned only works as a display function for value visualisation of the scene last recalled. Consequently, touching the sensor or display elements does not induce any response.

Status elements

The display area contains different display elements (figure 36) that are influenced by parameters or by the scene configuration itself. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby the function of the scene recall is identified for the user (e.g. "recall of the scene TV"). In addition, a status text (B) can be displayed below the name, which displays the name of the internal scene last recalled. After a device reset, the status text shows "---" until an internal scene has been recalled.

A symbol (C) can optionally be displayed in the lower display area. The scene function icon " ☺" is static and preset. Consequently, the icon does not change the display status.
The status text and icon can be omitted optionally.

Objects

No telegram is transmitted to the bus via the operating and display function during the recall of an internal scene using the function "Scene recall". Consequently, the function does not have its own communication objects. Only the internal scene function is activated.

4.2.4.3.13 Operating and display function "Operating mode switchover 4 x 1-bit"

With the KNX function "Operating mode switchover 4 x 1-bit " it is possible to activate a KNX room temperature controller that does not have 1-byte KNX objects for the operating mode switchover. The user can use this function to influence the control of a room temperature by presetting an operating mode.
The function "Operating mode switchover 4 x 1-bit" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a rocker function. No distinction is made between short and long operations.

An operation of the sensor surfaces ⟨ or ⟨ switches over the possible operating modes (Comfort, Standby, Night reduction, Frost/heat protection) successively. In the configuration software it is possible to define which modes a user can select by a sensor surface operation.

ℹ The operating mode selected by the sensor surfaces is first accepted as valid by the internal controller and transmitted to the bus approx. 2 seconds after completion of the operation.

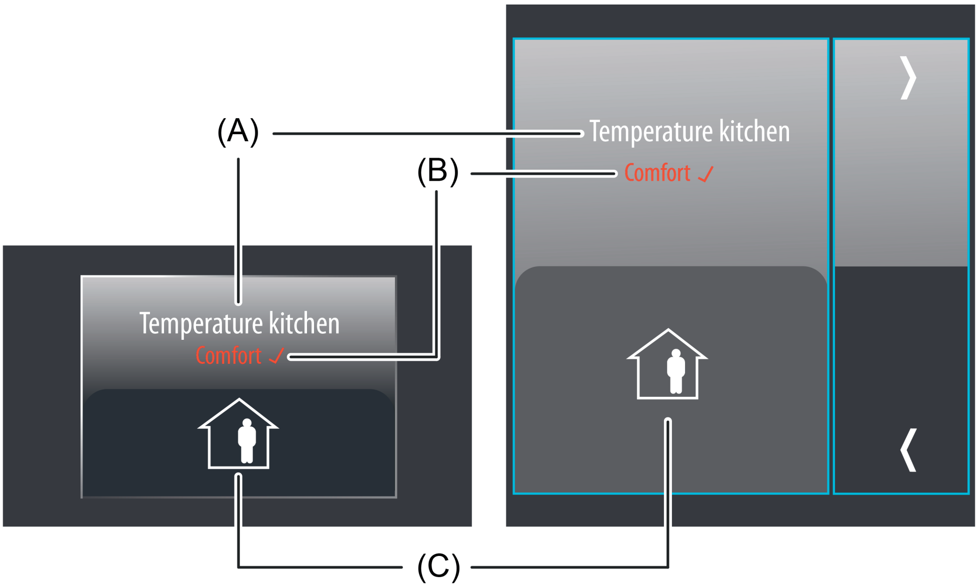


Figure 37: Example of an operating and display element of the function "Operating mode switchover 4 x 1-bit"

(A) Text name
(B) Status text
(C) Status icon

With the function "Operating mode switchover 4 x 1-bit", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned works solely as a display function for value visualisation of the set controller operating mode. Consequently, touching the sensor element does not induce any response.

Status elements

The display area contains different display elements (figure 37) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "room temperature kitchen"). In addition, a status text (B) can be

displayed below the name, which either displays values in plain text depending on the object value of the status feedback, or alternatively, directly depending on the operating element's operating mode presetting of the respective operating mode selected. The displayed text can be configured separately for each operating mode in the configuration software (e.g. "Comfort"). After a device reset, the display shows "---" until a status object value of the status text is received or an operating mode is predefined.
Once the controller has accepted the operating mode selected and preset by the sensor surfaces as valid, the display element displays a ✓ immediately after the status text. In this way, the user can identify whether the operating mode he desired was actually set. If ✓ still does not appear approx. 2 seconds after the last operation, the controller has not accepted the presetting. It then normally works in an operating mode with a higher priority (e.g. window status or KNX forced operating mode).
The controller must return its status to the display element to enable a valid acceptance of the last specified controller operating mode to be displayed. This takes place via the object "Feedback status" (see page 108). If the status feedback of the controller is not used (parameter "Use feedback object" is deselected), the display element automatically assumes after each presetting by the user that the operating mode last specified by the controller was also accepted as valid by the controller.

Similarly to the status text, a symbol (C) can be displayed in the lower display area (figure 38). The displayed icon is defined separately for each operating mode and can be disabled optionally in the configuration software so that it is not displayed individually for individual operating modes. The icons allow the set controller operating mode to be identified quickly and clearly.
The status text and icon can be omitted optionally.

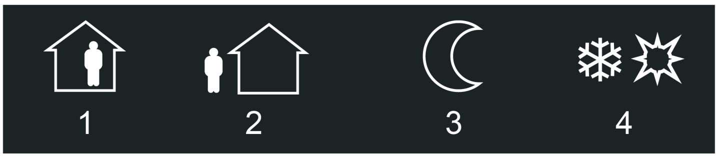


Figure 38: Status icons for the KNX function "operating mode switchover 4 x 1-bit"

1	Icon for comfort
2	Icon for standby
3	Icon for night reduction
4	Icon for frost / heat protection

With the function "Operating mode switchover 4 x 1-bit", it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned works solely as a display function for value visualisation of the set controller operating mode. Consequently, touching the sensor element does not induce any response.

Objects

The KNX function "Operating mode switchover 4 x 1-bit" has up to 5 KNX communication objects...

- "Comfort mode" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the comfort mode is activated. The object for the comfort mode of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Standby" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the standby operating mode is activated. The object for the standby operation of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Night reduction" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the night operating mode is activated. The object for the night operation of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Frost/heat protection" (1-bit transmitting and optional receiving):
  A "1"-telegram is transmitted to the bus via this object after pressing the sensor element when the frost/heat protection mode is activated. The object for the frost/heat protection mode of the room temperature controller is activated as a result.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications. This is advisable, for instance, if the activated KNX room temperature controller has a separate 1-byte status feedback object.

- "Feedback status (DPT 20.102)" (1-byte receiving):
  This object is only visible when the parameter "Use feedback object" is activated. Through this object the device can then receive a KNX compliant 1-byte status feedback of a KNX room temperature controller. This influences the status text and status icon that can be displayed in the display area of the function element.
  If the activated KNX room temperature controller does not have a separate 1-byte status feedback of the DPT 20.102, the parameter "Use feedback object" can be deselected whereby the status indications are activated via the four 1-bit objects. The display element evaluates the priorities of the four 1-bit objects automatically in this case and updates the status indications accordingly.

ℹ With the function "Operating mode switchover 4 x 1-bit" it is always necessary to occupy the four 1-bit communication objects "Comfort mode", "Standby", "Night reduction" and "Frost/heat protection" with separate group addresses and link them to objects of the activated room temperature controller with the same function!
If the activated room temperature controller enables a KNX-compliant operating mode switchover via 1-byte KNX objects, the function "Operating mode switchover KNX" should be reverted to.

4.2.4.3.14 Operating and display function "Operating mode switchover KNX"

With the KNX function "Operating mode switchover KNX " it is possible to activate a KNX room temperature controller that has 1-byte KNX objects for operating mode switchover. The user can use this function to influence the control of a room temperature by presetting an operating mode.
The function "Operating mode switchover KNX" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a rocker function. No distinction is made between short and long operations.

ℹ If the activated room temperature controller does not have 1-byte KNX objects for switching over the operating mode, the function "Operating mode switchover 4 x 1-bit" must be used.

An operation of the sensor surfaces 〈 or 〈 switches over the possible operating modes (Comfort, Standby, Night reduction, Frost/heat protection) successively. In the configuration software it is possible to define which modes a user can select by a sensor surface operation.

ℹ The operating mode selected by the sensor surfaces is first accepted as valid by the internal controller and transmitted to the bus approx. 2 seconds after completion of the operation.

The KNX operating mode switchover can affect two objects on the room temperature controller. This will result in alternatively different functions...

- The KNX operating mode switchover affects the normal KNX object for the operating mode switchover on the controller (low priority):
  In this case, the sensor element can switch over the operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection". This presetting of the operating mode is normally called "Automatic mode" in KNX controllers and can be overridden by other functions with a higher priority (e.g. window status, KNX forced - see below).
  The sensor element works according to this function if the parameter "Affects forced object" is deselected in the configuration software.

- The KNX operating mode switchover affects the KNX forced object for the operating mode switchover on the controller (high priority):
  In this case, the sensor element can switch over the Operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection" by means of forced presetting. This presetting of the operating mode is normally called "Forced operation" in KNX controllers and cannot be overridden by other functions. In addition, it is possible to activate the automatic mode by an operation of the sensor surface. The forced presetting is then deactivated and the controller switches over to the operating mode that was set in normal operation.
  The sensor element works according to this function if the parameter "Affects forced object" is selected in the configuration software.

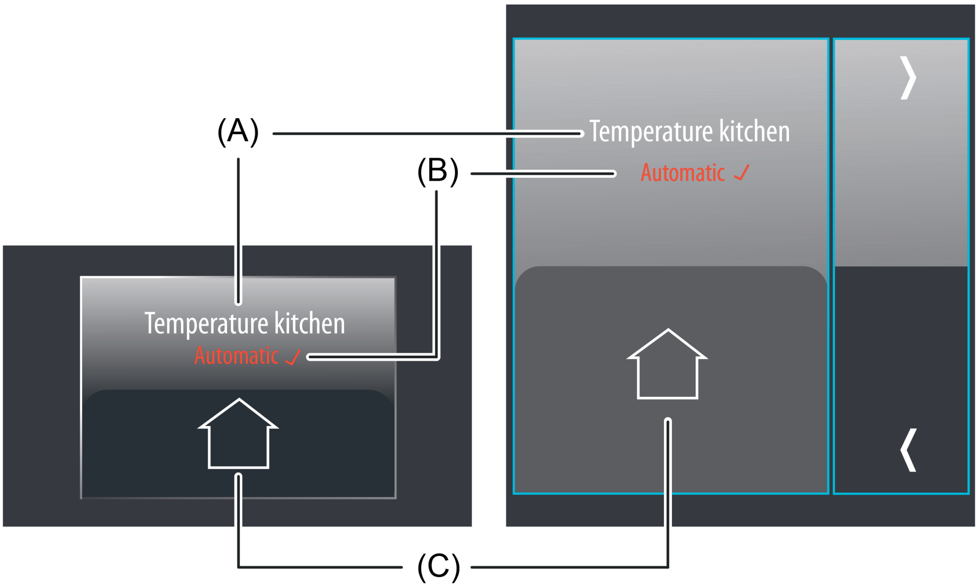


Figure 39: Example of an operating and display element of the function "Operating mode switchover KNX"

(A)	Text name
(B)	Status text
(C)	Status icon

With the function "Operating mode switchover KNX" it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned works solely as a display function for value visualisation of the set controller operating mode. Consequently, touching the sensor element does not induce any response.

Status elements

The display area contains different display elements (figure 39) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "room temperature kitchen"). In addition, a status text (B) can be displayed below the name, which either displays values in plain text depending on the object value of the status feedback, or alternatively, directly depending on the operating element's operating mode presetting of the respective operating mode selected. The displayed text can be configured separately for each operating mode in the configuration software (e.g. "Comfort"). After a device reset, the display shows "---" until a status object value of the status text is received or an operating mode is predefined.
Once the controller has accepted the operating mode selected and preset by the sensor surfaces as valid, the display element displays a ✓ immediately after the status text. In this way, the user can identify whether the operating mode he desired was actually set. If ✓ still does not appear approx. 2 seconds after the last operation, the controller has not accepted the presetting directly. It then normally works in an operating mode with a higher priority (e.g. window status or KNX forced operating mode).
The controller must return its status to the display element to enable a valid acceptance of the last specified controller operating mode to be displayed. This takes place via the objects "Feedback status" and "Feedback forced" (figure 39). If the status feedback of the controller is not used (parameter "Use feedback object" is deselected), the display element automatically assumes after each presetting by the user that the operating mode last specified by the controller was also accepted as valid by the controller.

Similarly to the status text, a symbol (C) can be displayed in the lower display area (figure 40). The displayed icon is defined separately for each operating mode and can be disabled optionally in the configuration software so that it is not displayed individually for individual operating modes. The icons allow the set controller operating mode to be identified quickly and clearly.
The status text and icon can be omitted optionally.

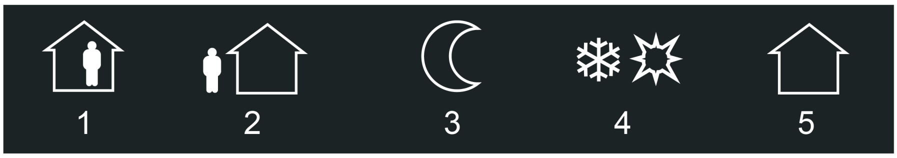


Figure 40: Status icons for the KNX function "operating mode switchover KNX"

1 Icon for comfort
2 Icon for standby
3 Icon for night reduction
4 Icon for frost / heat protection
5 Icon for automatic operation

With the function "Operating mode switchover KNX" it is possible to switch off the operating function completely in the configuration software. In this case, the function concerned works solely as a display function for value visualisation of the set controller operating mode. Consequently, touching the sensor element does not induce any response.

Objects

The KNX function "Operating mode switchover KNX" has up to 3 KNX communication objects...

- "Operating mode KNX" (1-byte transmitting and optional receiving):
  A value telegram according to KNX DPT "20.102" is transmitted to the bus via this object after pressing the sensor element. The operating mode of the activated room temperature controller is switched over as a result. Depending on the parameter "Affects forced object", either the normal KNX object for the operating mode switchover or the forced object of the controller is connected to this object.
  If the parameter "Use feedback object" is not selected, the object value received via this object also influences the status indications.

- "Feedback status (DPT 20.102)" (1-byte receiving):
  Through this object the device can then receive a KNX compliant 1-byte status feedback of the activated KNX room temperature controller. This influences the status text and status icon that can be displayed in the display area of the function element.
  This object should only be used if the operating element affects a KNX forced object via the object "operating mode KNX". The object "Feedback status" should then be linked to the KNX object for normal operating mode switchover of the controller. Otherwise, this object remains unused. The feedback of the status must be transmitted by the room temperature controller "actively transmitting" (set transmission flag if necessary).

- "Feedback forced (DPT 20.102)" (1-byte receiving):
  Through this object the device can then receive a KNX compliant 1-byte status feedback of the restraint of the activated KNX room temperature controller. This influences the status text and status icon that can be displayed in the display area of the function element.
  This object should only be used if the operating element affects a KNX object for the operating mode switchover via the object "operating mode KNX". The object "Feedback forced" should then be linked to the KNX forced object of the controller. Otherwise, this object remains unused. The feedback of the forced status must be transmitted by the room temperature controller "actively transmitting" (set transmission flag if necessary).

ⓘ If the activated room temperature controller does not have 1-byte KNX objects for switching over the operating mode, the function "Operating mode switchover 4 x 1-bit" must be used.

4.2.4.3.15 Operating and display function "Restraint"

With the KNX function "Restraint" it is possible to activate KNX actuators (normally these are switch actuators) at two different priority levels with just one operating element. By using this function the user can also define switching states independent of a normal operation in order to interlock the actuator channel in this way. Actuators that should be activated by the function "Restraint" must have a 1-bit communication object (normally "Switching") and 2-bit object (normally "Restraint"). The desired switching state ("1" or "0") is communicated to the actuator in normal operation via the 1-bit object. The actuator can be interlocked in a defined switching position via the forced object. The switching state is then predefined directly by the forced position telegram. The first bit (bit 0) of the forced object specifies the switching state to be forced. The second bit (bit 1) of the object activates or deactivates the forced-position state (see table below). The switching object is only evaluated in normal operation. The restraint is then inactive.

Bit 1	Bit 0	Function
0	x	Forced position inactive, normal operation
1	0	Forced position active, OFF
1	1	Forced position active, ON

Encoding of the 2-bit forced position

The function "Restraint" has a display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation). The sensor element is always executed as a rocker function. No distinction is made between short and long operations.

When the operating element of the function "forced position" is pressed, it switches over between the states "Normal operation OFF", "Normal operation ON", "Forced position active, OFF" and "Forced position active, ON". The necessary telegrams are transmitted to the bus via both communication objects of the function (see page 115) for this purpose. Similarly, the display element evaluates the values of both objects and updates the status elements accordingly.

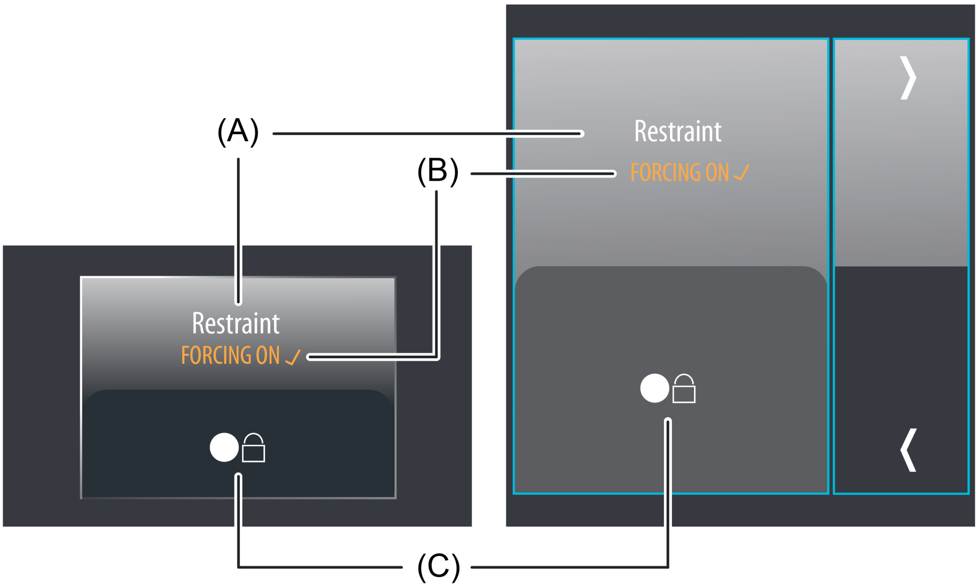


Figure 41: Example of an operating and display element of the KNX function "Restraint"

(A)	Text name
(B)	Status text (configurable)
(C)	Status icon (configurable)

Status elements

The display area contains different display elements (figure 41) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "Restraint"). In addition, a status text (B) is displayed below the name, which displays the respective switching state selected in plain text depending on the object values (in normal operation or by restraint). The displayed text can be configured separately for each state in the configuration software (e.g. "FORCING ON"). After a device reset, the display shows "---" until an object value of the status text is received or predefined. When the controller has accepted the switching state selected by the sensor surfaces in the object values as valid and thus transfers it to the actuator, the display element displays a ✓ immediately after the status text.

Similarly to the status text, a symbol (C) is displayed in the lower display area. The displayed icon can be defined in the configuration software separately for each switching state. An icon selection is provided for this purpose (figure 42). The assignment of the icons to the four states is optional. This means that inverted switching states can also be represented.

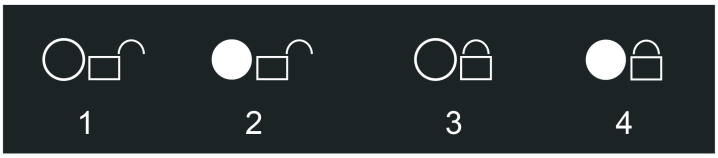


Figure 42: Status icons for the KNX function "Restraint"

1	Icon for "Normal operation OFF"
2	Icon for "Normal operation ON"
3	Icon for "Restraint active OFF"

4 Icon for "Restraint active ON"

Objects

The function "Forced position" has 2 KNX communication objects...

- "Switching" (1-bit transmitting and receiving):
  A switching telegram for activating the states "Normal operation OFF", "Normal operation ON" is transmitted to the bus via this object after pressing the sensor element. This object must be linked with the input object of the activated actuator (normally "Restraint").
  Similarly to the operation, telegrams received via this object activate the status elements. The switching state received via this object is evaluated if no restraint is activated.

- "Forced object" (2-bit transmitting and receiving):
  A switching telegram for the restraint "Restraint active, OFF" and "Restraint active, ON" is transmitted to the bus via this object after pressing the sensor element. This object must be linked with the forced object of the activated actuator.
  Similarly to the operation, telegrams received via this object activate the status elements. The state of the restraint received via this object is evaluated with a higher priority than the object "Switching".

4.2.4.3.16 Operating function "Internal open page"

With the function "Internal open page" it is possible to open one of the display pages configured internally in the device. In this way, it is possible to implement navigation elements on display pages. The function is always executed as a push-button function. No distinction is made between short and long operations.

The function "Internal open page" has a simple display element and sensor surface in the graphic interface for operation. The display area and sensor area, depending on the existing operation concept, are combined into one surface (direct operation) or distributed on two surfaces (selection operation).
In the event of an open page via the operating element, no telegram is transmitted the bus. Consequently, the function does not have its own communication objects.

The parameter "target" specifies which page is to be recalled during an operation.

An internal open page is also possible via the Quicklinks (see page 64-65). Quicklinks are defined separately in the configuration software.

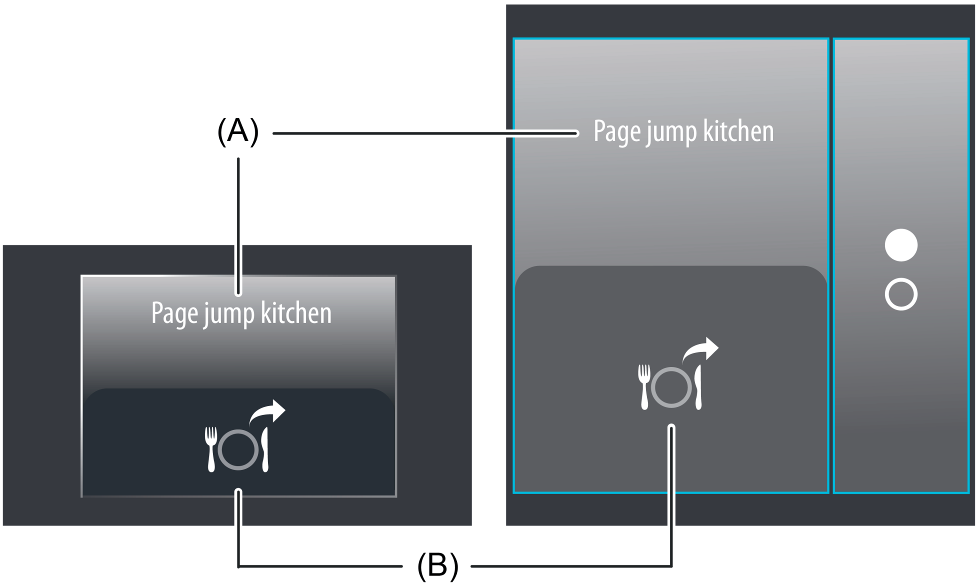


Figure 43: Example for operating element of the function "Internal open page"
left: direct operation / right: selection operation

(A) Text name
(B) Status icon (configurable)

Status elements

The display area contains different display elements (figure 43) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable functions are identified for the user (e.g. "Page jump kitchen").

A symbol (B) is displayed in the lower display area. The displayed icon is static and can be defined in the configuration software. An icon selection is provided for this purpose.

Objects

If an internal page is opened via the function "Internal open page", no telegram is transmitted to the bus. Consequently, the function does not have its own communication objects.

4.2.4.3.17 Display function "Date / Time"

The function "Date / Time" is purely a display function for displaying the current time and current date of the internal system clock of the device. The function does not have any operating element or its own communication objects.

ℹ The display element of this function is controlled by the device's internal system clock (time and date of the operating system). Consequently, a valid time and current date must be preset to ensure correct display. The system clock can be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001) or via the system settings.

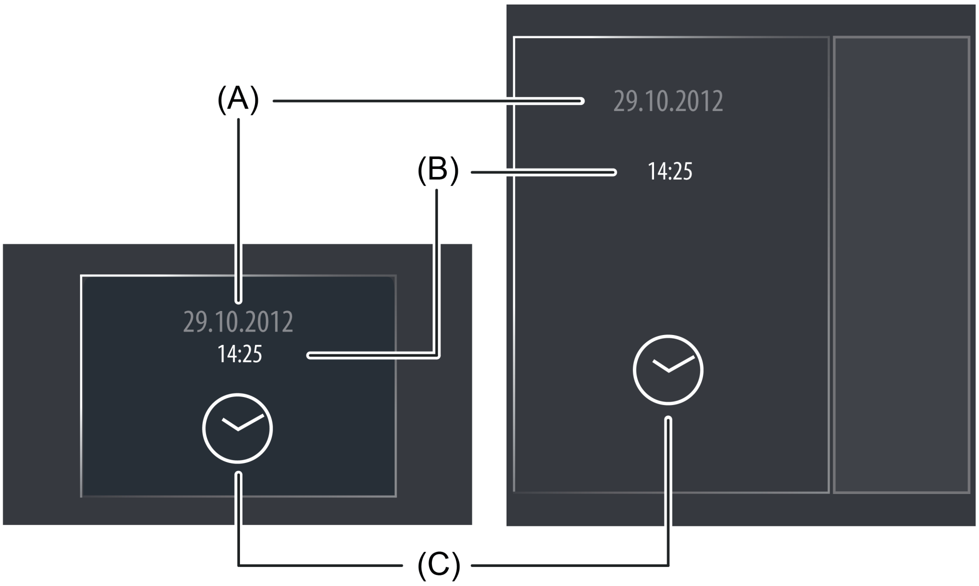


Figure 44: Example of a display element of the function "Date / Time"
left: direct operation / right: selection operation

(A) Displaying the date
(B) Displaying the time
(C) Status icon (static)

Status elements

The display area contains different display elements (figure 44) that are influenced by parameters. The date (A) can be displayed above or below the time (B). This defines the parameter "Date time format". Optionally, it is also possible just to display the date or time. The parameters "Date display format" and "Time display format" define the format of the display elements and make it possible to adapt the date and time display to international systems.
In the lower display area a clock icon (C) is statically displayed.

To adjust the time to various time zones, the system time display can be shifted hourly by a time offset. The parameter "Time offset" is provided for this purpose. The set value (-12...0...12) defines the time shift directly in hours.

Objects

The function "Date / Time" derives the display information from the device's internal system clock. Therefore, this display function does not have its own communication objects.

4.2.4.3.18 Display function "KNX Time"

The function "KNX Time" is purely a display function for displaying a time received via a telegram. The function has no operating element.

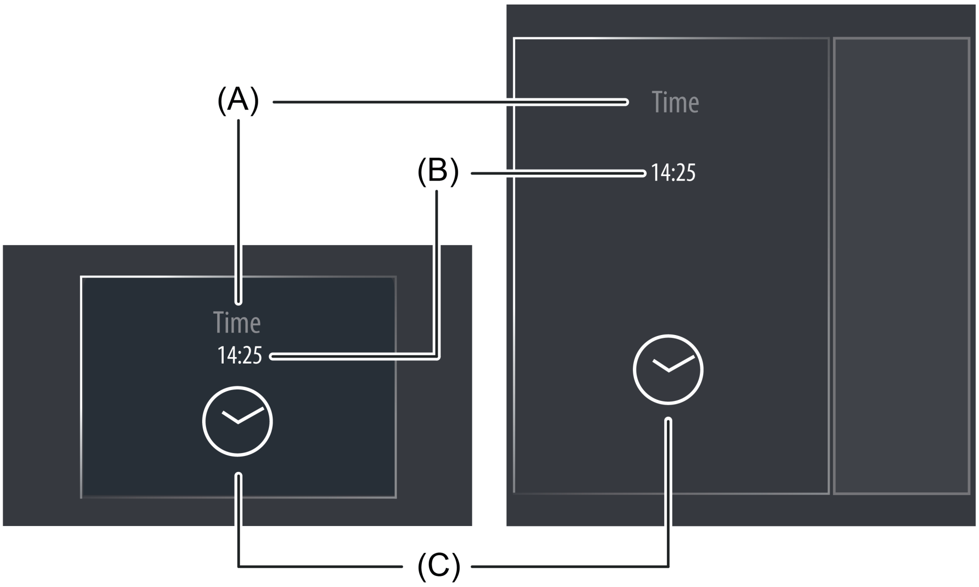


Figure 45: Example of a display element of the function "KNX Time"
left: direct operation / right: selection operation

(A) Text name
(B) Displaying the time
(C) Status icon (static)

Status elements

The display area contains different display elements (figure 45) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "Time"). The time (B) is displayed below this. The parameter "Time display format" defines the format of the display element and makes it possible to adapt the time display to international systems.
In the lower display area a clock icon (C) is statically displayed.

To adjust the time to various time zones, the time display can be shifted hourly by a time offset. The parameter "Time offset" is provided for this purpose. The set value (-12...0...12) defines the time shift directly in hours.

Objects

The function "KNX time" has one KNX communication object...

- "Time" (3-byte receiving):
  The current time is transferred to the display element via this object. The data format must correspond to the KNX DPT 10.001.
  The day contained in the time telegram is not evaluated by the display element.

4.2.4.3.19 Display function "KNX Date"

The function "KNX Date" is purely a display function for displaying a date received via a telegram. The function has no operating element.

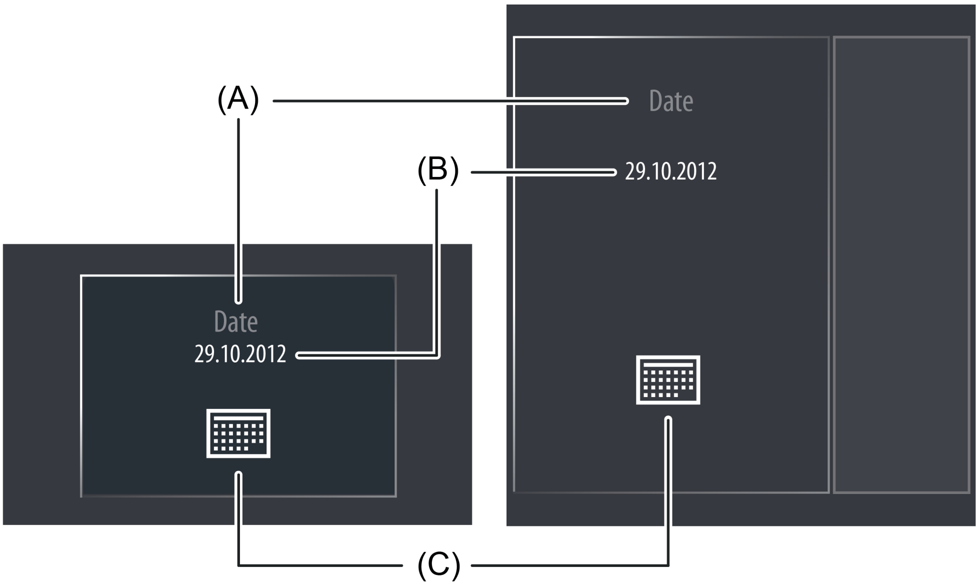


Figure 46: Example of a display element of the function "KNX Date"
left: direct operation / right: selection operation

(A) Text name
(B) Displaying the date
(C) Status icon (static)

Status elements

The display area contains different display elements (figure 46) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "Date"). The date (B) is displayed below this. The parameter "Date display format" defines the format of the display element and makes it possible to adapt the date display to international systems.
A calendar icon (C) is statically displayed in the lower display area.

Objects

The function "KNX Date" has one KNX communication object...

- "Date" (3-byte receiving):
  The current date is transferred to the display element via this object. The data format must correspond to the KNX DPT 11.001.

4.2.4.3.20 Display function "ASCII text display"

The function "ASCII text display" is purely a display function for displaying a text received via a telegram in accordance with ASCII encoding. Thus, it is possible for example to visualise the status of a KNX alarm centre.
The function has no operating element.

Optionally, the integrated signal encoder of the device can be contacted when a text is received. If the parameter "On receipt of acoustic signal" is set, the device will output a signal once for each new telegram. It is useful to use this acoustic display function if text displays should signal important events or states to the user of the device.

Upon receipt of a value, the display will jump directly to the display page of the text display if the parameter "Upon receipt switch on display illumination / display element" is set. In this case, the display illumination is also switched to the work brightness. Otherwise, the updating of the text display element takes place in the background.

The acoustic signal and direct display of the text and switching on of the display illumination during the update can be suppressed - during the night for example - if necessary. The ASCII text display has its own disabling function for this purpose. As soon as the disabling function is active (telegram polarity configurable), the text display is still. The display element is then updated in the background.

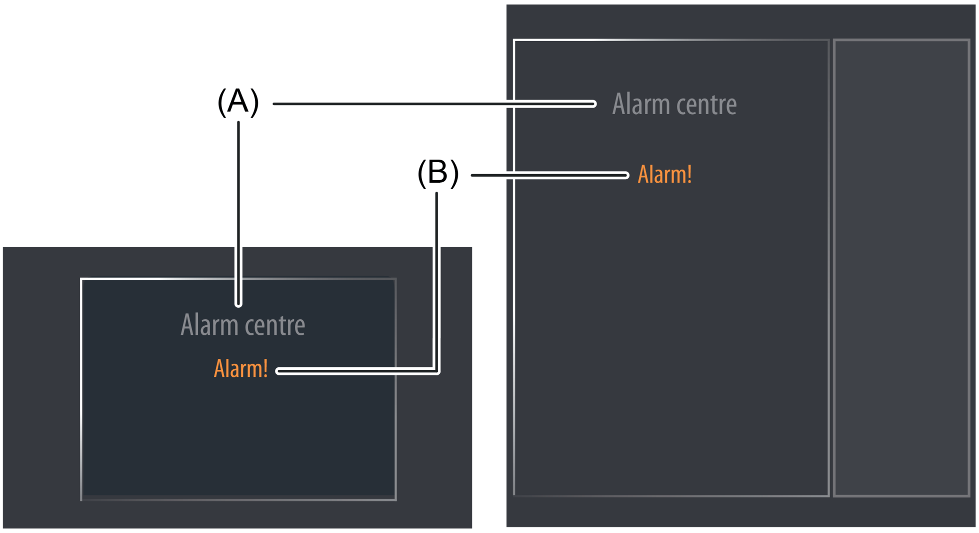


Figure 47: Example of a display element of the KNX function "ASCII text display"
left: direct operation / right: selection operation

(A) Text name
(B) ASCII text

Status elements

The display area contains different display elements (figure 47) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "alarm centre"). The ASCII text (B) is displayed below this. The parameter "Length of the ASCII text" defines the number of text characters to be displayed (max. 14). If the number of characters in the text exceeds the defined number of text characters, the text will be truncated in the display.
Example: Length of the ASCII text =10 -> the object receives a longer text -> the text is truncated in the display after the 10th character.

Objects

The KNX function "ASCII text display" has up to 2 KNX communication objects...

- "ASCII Text" (14-byte receiving):
  The text to be displayed is communicated to the display element via this object. The data format must correspond to the KNX DPT 16.001.
- "Disabling object" (1-bit receiving):
  This function activates or deactivates the disabling function of the text display element. The telegram polarity (disable / enable) can be configured in the configuration software.

4.2.4.3.21 Display function "collective feedback"

The KNX function "Collective feedback" is purely a display function for assessing and displaying a 4-byte collective feedback bit-orientated. As a result, it is possible to visualise the state of a defined switching channel of a compatible KNX switch actuator.
The function has no operating element.

After central commands or the return of bus voltage, the telegram load of a bus line is usually high, as many bus devices, such as switching actuators, transmit the status of their communication objects as feedback. This effect increases when each switching channel of an actuator initialises in this manner. To keep the telegram load of a KNX line low during the initialisation of the devices, collective feedback can be used for some actuators. The collective feedback summarises the switching status of all the outputs of an actuator in just one telegram. The 32 bit communication object "Collective feedback" contains bit-orientated feedback information of up to 16 switching channels (figure 48).

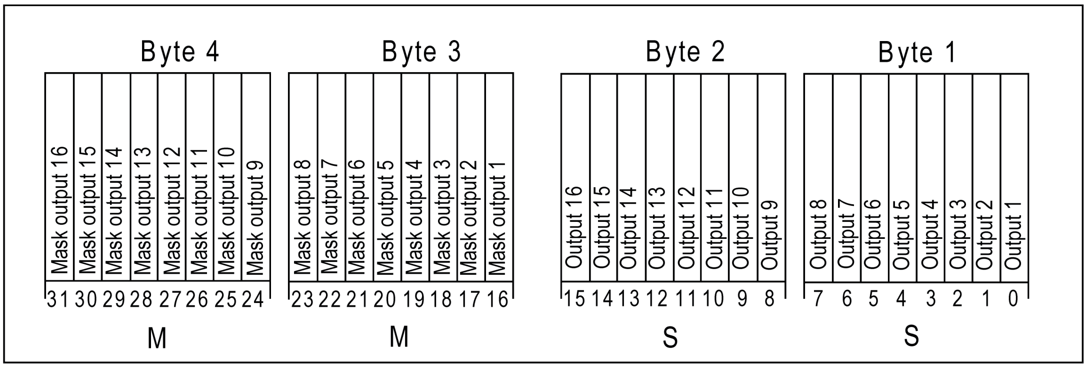

Byte 4
Byte 3
Byte 2
Byte 1
Mask output 16
Mask output 15
Mask output 14
Mask output 13
Mask output 12
Mask output 11
Mask output 10
Mask output 9
Mask output 8
Mask output 7
Mask output 6
Mask output 5
Mask output 4
Mask output 3
Mask output 2
Mask output 1
Output 16
Output 15
Output 14
Output 13
Output 12
Output 11
Output 10
Output 9
Output 8
Output 7
Output 6
Output 5
Output 4
Output 3
Output 2
Output 1
31 30 29 28 27 26 25 24
23 22 21 20 19 18 17 16
15 14 13 12 11 10 9 8
7 6 5 4 3 2 1 0
M
M
S
S

Figure 48: Telegram structure of collective feedback

It is possible to show up to 16 different switching states logically in a telegram. In so doing, each output possesses a bit, which signals the switching state ("S bit), and an additional bit, which defines the masking ("M" bit). The "S" bits correspond to the logical switching states of the outputs and are either "1" (switched on) or "0" (switched off). The "M" bits are "1" when the actuator possesses this output. In the same way, the "M" bits are "0" when the appropriate output is not available on the actuator. In the latter case, the corresponding "S" bits are continuously "0" as there is no switching status.
Example: with a 16x switching actuator, all the 16 M bits are set in a telegram as this actuator possesses all the channels which can be shown in the collective feedback. By contrast, with an 8x actuator only the first lower 8 M bits (byte 3) are set, as this actuator only possesses 8 channels. The top 8 M bits (byte 4) are thus set to "0" in the collective feedback telegram. For actuators with a different amount of channels, the number of M bits behaves in the same way.

The display element can display the switching state of an actuator channel of the collective feedback. The parameter "Channel to be evaluated" (1...16) determines which channel of the collective feedback is evaluated. The display element only evaluates the specified channel in the collective feedback telegram, i.e. it inserts the appropriate M bit and S bit (figure 49).

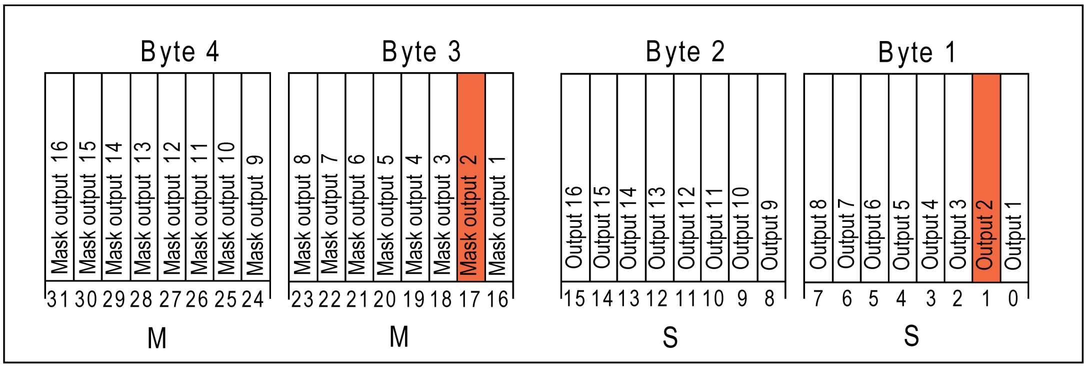

Byte 4
Byte 3
Byte 2
Byte 1
Mask output 16
Mask output 15
Mask output 14
Mask output 13
Mask output 12
Mask output 11
Mask output 10
Mask output 9
Mask output 8
Mask output 7
Mask output 6
Mask output 5
Mask output 4
Mask output 3
Mask output 2
Mask output 1
Output 16
Output 15
Output 14
Output 13
Output 12
Output 11
Output 10
Output 9
Output 8
Output 7
Output 6
Output 5
Output 4
Output 3
Output 2
Output 1
31 30 29 28 27 26 25 24
23 22 21 20 19 18 17 16
15 14 13 12 11 10 9 8
7 6 5 4 3 2 1 0
M
M
S
S

Figure 49: M bit and S bit of a display element to be evaluated

Only when the read-in M bit is set in the telegram, i.e. the channel is available on the actuator, does the device evaluate the corresponding S bit and display the status "On" or "Off" in the display element. Either image texts or status icons can be displayed as text or an icon, according to the status indication. If the M bit of the channel to be evaluated is not set in the collective feedback telegram, i.e. the appropriate actuator channel does exit, then the display element displays the status "Invalid". This is a case of bad programming.

i Care must be taken to ensure that a unique group address is used for the collective feedback of an actuator. This group address must be connected with the collective feedback object of the actuator and with the collective feedback objects of various display elements of the device (max. 16). Ensure that, at no time, more than one actuator is connected with a collective feedback group address. If the collective feedback of various actuators is to be displayed on the device, then multiple group addresses must be used.

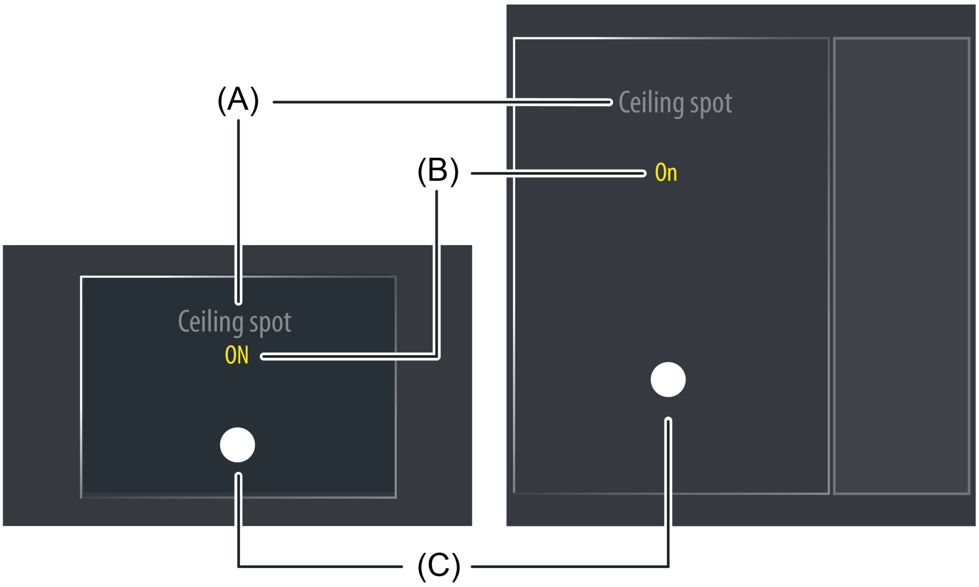

(A)
(B)
(C)
Ceiling spot
On
Ceiling spot
ON

Figure 50: Example of a display element of the KNX function "Collective feedback"
left: direct operation / right: selection operation

(A) Text name
(B) Status text (configurable)
(C) Status icon (configurable)

Status elements

The display area contains different display elements (figure 50) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "ceiling spot"). In addition, a status text (B) is displayed below the name, which visualises different texts (e.g. "Off" / "On") in the display depending on the object value of the masked collective feedback. In the configuration software the texts for the states "On", "Off" and "Invalid" can be defined separately from each other.
After a device reset, the "Invalid" state is displayed until a feedback object value of the status text is received.

Similarly to the status text, a symbol (C) is displayed in the lower display area depending on the state of the masked collective feedback. Parameters in the configuration software define which status icons are used in the display element for the states "On", "Off" and "Invalid". This makes it possible to adapt the icon display to the activated function (e.g. switching of lighting). The configured status icon changes depending on the switching state thereby enabling the state of the controlled KNX function to be read clearly (e.g. ◡: Lighting OFF, ☀: Lighting ON).
Icons can be omitted optionally.

Objects

The KNX function "Collective feedback" has one KNX communication object...

- "Feedback" (4-byte receiving):
  The value of the collective feedback is communicated to the display element via this object. This object must be linked via a group address to the object of one actuator with the same function. Additional display elements can be linked optionally to the same group address but not additional actuators!

4.2.4.3.22 Display function "dimmer actuator load type"

The KNX function "dimmer actuator load type" is purely a display function for assessing and displaying a 1-byte feedback for the load type. As a result, it is possible to visualise the set or calibrated load type of a compatible KNX universal dimmer actuator.
The function has no operating element.

The feedback of the load type enables the display element to indicate which dimming principle the dimmer output of a KNX dimmer actuator is working in. With universal dimmer actuators, it is thus possible to determine whether the dimmer output has adjusted to forward phase or inverse phase operation.
Feedback of the load type is provided using a 1 byte object in each dimmer actuator channel. The object must have the value encoding shown in the following table.

Object value	Meaning
0	Load type undefined
1	Load type capacitive / ohmic
2	Load type, inductive
3	Load type, universal, dimmer actuator adjusted to capacitive or ohmic load
4	Load type, universal, dimmer actuator adjusted to inductive load
5...255	Not used

Meaning of the object values for a dimmer actuator load type feedback

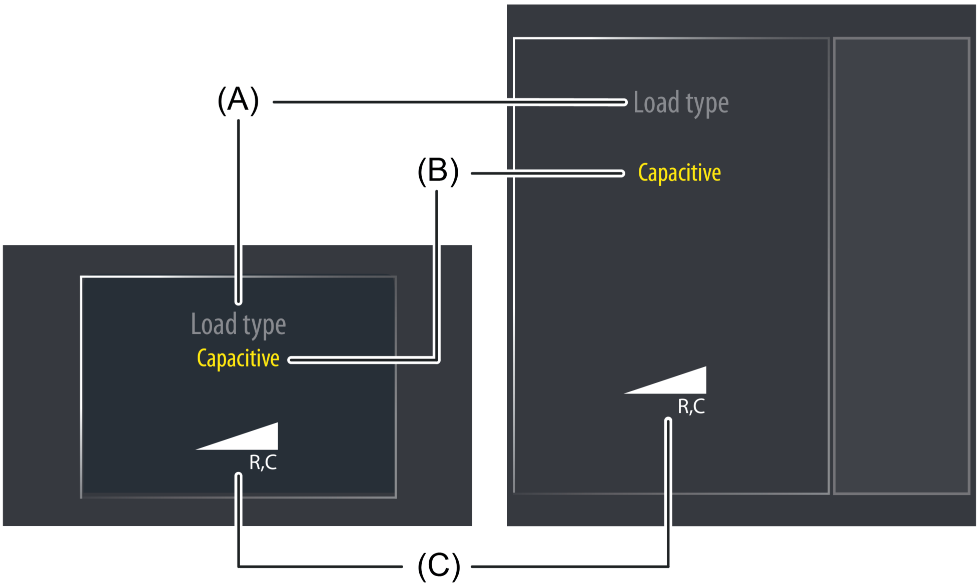


Figure 51: Example of a display element of the KNX function "dimmer actuator load type"
left: direct operation / right: selection operation

(A) Text name
(B) Status text (configurable)
(C) Status icon (configurable)

Status elements

The display area contains different display elements (figure 51) that are influenced by parameters. A name can be assigned to each KNX function in the configuration software (A). This text name is centred in the display element for display whereby controllable KNX functions are identified for the user (e.g. "load type"). In addition, a status text (B) is displayed below the name, which visualises different texts in the display depending on the object value of the feedback. In the configuration software, the texts for the states "0 - Undefined", "1 - Capacitive", "2 - Inductive", "3 - Universal/Capacitive" and "4 - Universal/Inductive" can be defined separately from each other.
After a device reset, the display shows "---" until an object value or an invalid feedback (values 5...255) of the status text is received.

Similarly to the status text, a symbol (C) is displayed in the lower display area depending on the state of the feedback. The icons displayed are defined separately for each state and can be disabled optionally in the configuration software so that they are not displayed individually for individual load types.
The status text and icon can be omitted optionally.

Objects

The KNX function "dimmer actuator load type" has one KNX communication object...

- "Signalling load type" (1-byte receiving):
  The value of the feedback of the load is communicated to the display element via this object. This object must be linked via a group address to the object of one compatible KNX dimmer actuator with the same function. Additional display elements can be linked optionally to the same group address but not additional actuators!

4.2.4.4 Freely-structurable display and operating functions

The device displays all KNX functions clearly and concisely. By touching it is possible to execute functions such as switching, dimming and Venetian blind control, to save and recall light scenes as well as visualize and evaluate complex functions such as value transmitter, date and limiting values. A clear and comprehensible menu navigation ensures fast access to the desired functions.

In addition to using predefined display pages, the freely-structurable display and operating functions can also be used according to customer needs. Coloured images, in BMP JPG, PNG and SVG format, can then be included as wallpapers to aid desktop design, and can also be used as icons.

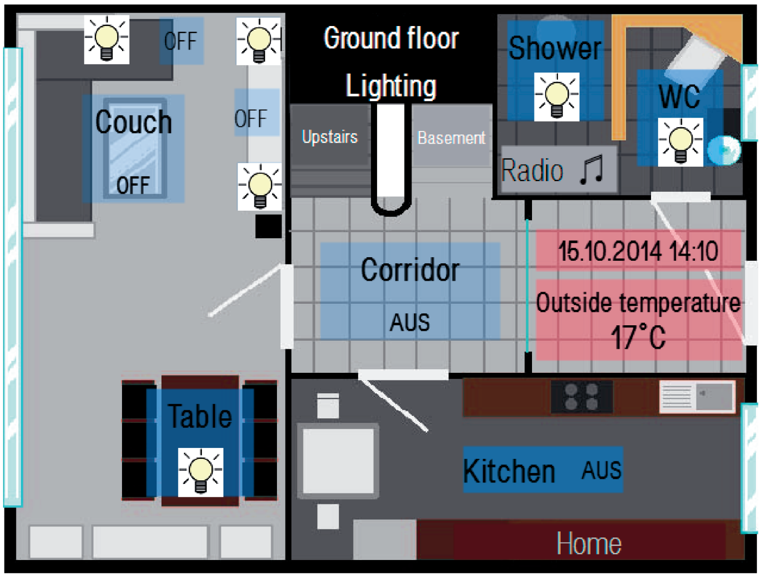


Figure 52: Example of a visualisation: Freely-structurable display pages

When designing this application example (figure 52), the plan of a storey of a housing building was inserted as a background image in a master of the free project design. The display view shown presents some operating elements for lighting control on one page of the free project design. In addition, the date and time are displayed via an alarm of the "System date/time" function and the temperature via a value transmitter element. The operating elements "Upper storey" and "Basement" cause, exactly like the "Home" operating element, a page to be recalled internally.

ℹ If a page of the free project design is selected as a "return page" as well as a "Page after device restart" in the settings of the JUNG GUI-Designer, one element of the "Internal open page" (see page 130-131) function should be inserted on at least one page of the free project design with the target to the function outside of the free project design (Start, Settings, Security, Browser, etc.). As a result, the user, for example, will be able to access the device settings or to open the datalogger on the device.
It is possible to return to the pages of the free project design via a Quicklink(see chapter 4.2.4.3.1. Display structure).

ℹ As soon as the Smart Panel has been commissioned exclusively with pages of the free project design and without any element of the "Internal open page" function with the target to a function outside of the free project design, additional project design work is only possible during IP commissioning. In this case, the operator will have no possibility of editing the predefined display and operating functions on the device and thus of editing the settings of the device either.

4.2.4.4.1 Display structure

Display pages

During free project design, operating and display elements on the screen interface can be arranged freely on different display pages. The size of each page is the same as the graphic screen of the device. Elements can be freely positioned on the pages (figure 53). In the configuration software, pages can be created in the structure view as required.

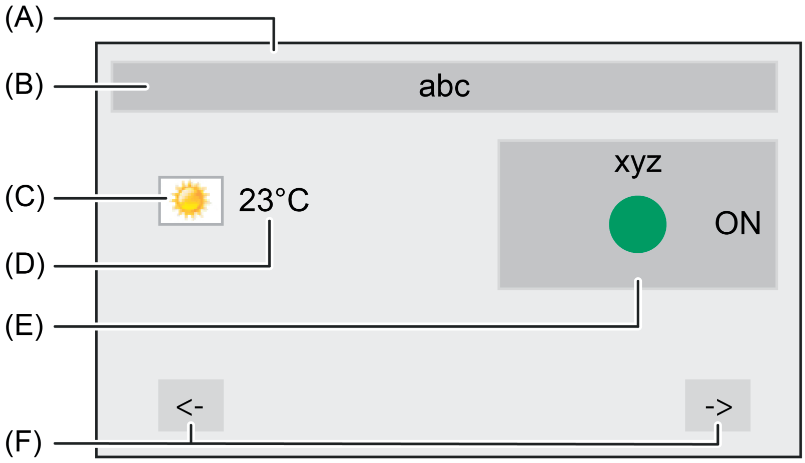


Figure 53: Example of a display page of the free project design with different operating and display elements

(A) Page (screen format: 640 x 480 pixels, 14.5 cm [5.7"], 4:3)
(B) Element with labelling and background colour (static display, no operating function)
(C) Element with status icon (bus-controlled display, no operating function)
(D) Element with the "ASCII Text" function (bus-controlled display, no operating function)
(E) Element with labelling, status icon, value and background colour (bus-controlled display, with operating function)
(F) Element with labelling and background colour for page navigation (static display, with operating function)

Master pages can optionally be configured. Master pages are template pages and make it easier to reuse identical elements on several pages, for example, for the identical positioning of operating elements for page navigation. One page of the free project design can be assigned to one master page each as required. The master page is graphically behind the display page so that the elements of both pages add to a common view (figure 54). For this purpose, it is essential that "transparency" is set as background colour of the page.

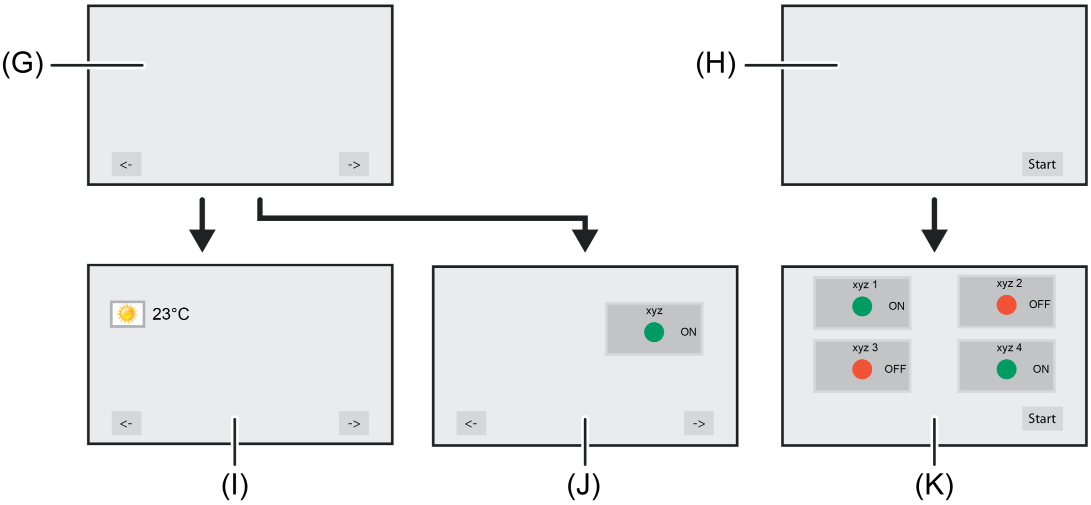
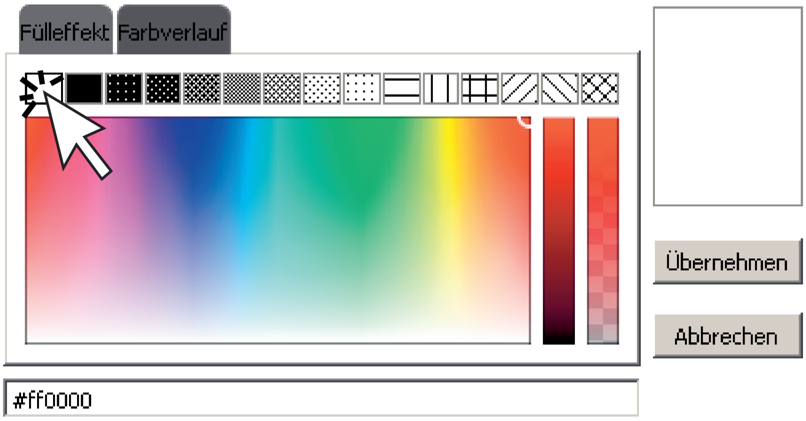


Figure 54: Example of using master pages

(G) Master page 1 with 2 operating elements (e.g. Navigation forward / back)
(H) Master page 2 with 1 operating element (e.g. jump to start page)
(I) Page 1 linked to master page 1
(J) Page 2 linked to master page 1
(K) Page 3 linked to master page 2

Pages and master pages of the free project design have the following parameters for defining the display...

- Background colour:
  Each page can be assigned its own background colour. The presetting is performed in the scheme "RGB", in greyscales or based on predefined patterns. Colour gradients can also be adjusted. A colour palette (figure 55), which is opened by double-clicking one of 20 predefined colours, makes it easier to adjust the colours in the configuration software. A transparency can also be specified optionally. The setting of a transparent background becomes essential if a uniform background design is to be implemented on multiple pages of the free project design. When doing so, it is possible to define the background once as a page master and to link this afterwards to individual pages of the free project design. The transparent background design is also selected within the colour palette.



#ff0000

Figure 55: Example of selecting the filling effect of transparency

- Wallpaper:
  Each page can be allocated its own wallpaper. Coloured or monochrome images (graphics or photos), in BMP JPG, PNG and SVG format, can then be included to aid desktop design. The presetting is performed with the help of a file browser in the configuration software.
  The scaling and positioning of the wallpaper can be defined by a parameter. This enables display in the original size, multiple repetition of the image (tile), central adjustment to the height of the screen, elongated adjustment to the overall screen format (unproportional) and elongated adjustment to the screen (proportional).
  Wallpapers cover coloured images and elements of the master page, provided that image contents do not have a transparent character (possible with PNG and SVG).

ℹ The images specified in the configuration software and thus integrated in the project design of the device are copied to a special project directory. When saving the configuration, images are also written in the project file, in order to be available in other PC environments as well.

ℹ During commissioning, the images are transferred to the device in the original file size and stored in the device memory. To avoid having to commit large amounts of storage resources for individual elements, the size of the image should be adapted to the display size in the screen or in the display elements. Ideally, a full format wallpaper should match the screen format (640 x 480 pixels).

- Page master:
  This parameter is only available for the normal pages and defines which master page is allocated. A display page can only ever be linked to one master page.

Internal open page, external open page and password protection

Pages of the free project design can also be displayed by an internal open page (defined jump to a configured page or page return). The operating function "Internal open page" is available for this purpose. To ensure that this function is available on a page, an element must be created on a page or master page and configured with the "Internal open page" function. The "Target" parameter defines the page which is jumped to when the element is actuated. Pages of the free project design, as well as pages of the main menu and submenu levels and function pages of the preconfigured project design, can be specified here. If "Back" is selected here, this induces a direct return to the display page that was active previously. This makes dynamic page returns possible (opening of a page by different pages and page return with just one element).

An internal open page is also possible via the Quicklinks (see page 64-65). Quicklinks are defined separately in the configuration software.

As an alternative or supplement to the internal open page, all the pages of the free project design can also be displayed using an external bus telegram per recall. For this purpose, each page optionally has its own 1-bit communication object. If the parameter "Enable external open page" is set, which is available separately for each page of the free project design, the object "External open page" becomes visible in the configuration software. As as soon as a "1"-telegram is received via this object during the running time of the device, the on-screen display switches over immediately to the corresponding display page. In this way, screen pages can be opened by other bus devices (e.g. by KNX presence detectors if a person is present in the room).

ℹ The reception of a "0" telegram via the object "external open page" will show no response. The last telegram received defines which page is opened.

The opening of pages of the free project design can also optionally be protected by a password. Up to 4 password levels are available for this in the device. To activate the password protection, a password level must be assigned to a display page in the configuration software. The corresponding page will first then be displayed by an open page request (external or internal open page) if the correct password assigned to the level was entered. A keyboard is available on the screen for entering the password.
Provided that the user is within a password level when navigating through display pages, it is not necessary to enter the password each time the page changes. This first becomes necessary when the user changes to a higher password level. When changing from a higher to a lower

password level, it is not necessary to enter the corresponding password.
The activation of a password level after correctly entering the password remains active for approx. 40 seconds. After this time has elapsed, the password of a level must be entered again when changing a page.

ℹ The display page of the signalling system and the commissioning by means of IP are protected by their own passwords.

ℹ The password protection is also active in the event of an external open page by the communication object. If a page protected by a password is opened, it is then necessary to enter the correct password on the device via the on-screen keyboard. The display will remain in the keyboard screen until a valid password has been entered and confirmed. No other external open pages will be performed during this waiting state.

4.2.4.4.2 Operating and display function "Elements"

In free project design, operating and display elements on the screen interface can be arranged freely and the size can be defined. In contrast to the predefined operating and display functions (see chapter 4.2.4.3. Predefined display and operating functions), the functions of the free project design can be characterised as required. Thus, there are no longer specified operating and display areas for an element. Operating commands (ON, UP, OFF, etc.), as well as the position and format of the status display, can be configured almost without limit within an element. Status elements can be characterised as text or icon (figure 53). In addition, an element can have a static icon for creating simple display elements (e.g. for the graphic preparation of a display page).

The properties of an element that describe the parameters in the configuration software can be distinguished essentially in two parts...

- Specification and configuration of the function,
- Specification of the layout.

Function of an element for display or operation

Each element of the free project design can execute operating and display functions. In contrast to the elements of the preconfigured project design, operating and display areas are no longer fixed. A free element can either execute just one display function, alternatively just one operating function or one operating and display function in combination. In addition, the operating commands (ON, OFF, UP, DOWN, etc.) are not preset.
The "Function" parameter of a free element defines the basic functionality and specifies the KNX functionality, among other things. Consequently, the required communication objects and operating parameters (command during operation) are defined and displayed in the configuration software. The functions for the free project design and for the predefined project design are generally identical. For this reason, in the free project design, there are also the same operating and status functions in combination with identical objects and parameters. Alternatively, status texts or icons can be hidden.
For more information, please refer to the exact description of these functions in the corresponding chapters of the predefined project design.

The following functions can be adjusted for elements of the free project design (with page reference to the detailed description of the available operating and status functions)...

- Switching (see page 71)
  Difference in the case of free project design:
  Operating command is adjustable -> Command on releasing: ON, OFF, TOGGLE, no function
  -> Push-button function ON (Press ON, Release OFF), push-button function OFF (Press OFF, Release ON)
- Dimming Start/Stop (see page 73)
  Difference in the case of free project design:
  Operating command is adjustable -> Brighter (ON), Darker (OFF), Brighter/Darker (TOGGLE), no function
- Dimming brightness value (see page 76)
  Difference in the case of free project design:
  Operating command is adjustable -> Brighter (ON), Darker (OFF), Edit (preset value via the keyboard), no function
- Venetian blind Step / Move / Step (see page 79-80)
  Difference in the case of free project design:
  Operating command is adjustable -> UP, DOWN, TOGGLE, no function
  Display is adjustable -> The status text can optionally display the blind/shutter position or the slat position.
- Venetian blind position (see page 82-83)
  Difference in the case of free project design:
  Operating command is adjustable -> Blind/shutter UP, Blind/shutter DOWN, Edit blind/shutter, Slat UP, Slat DOWN, Edit slat, no function
  Display is adjustable -> The status text can optionally display the blind/shutter position or the slat position.

- Rolling shutter Step / Move (see page 87-88)
  Difference in the case of free project design:
  Operating command is adjustable -> UP, DOWN, TOGGLE, no function
- Rolling shutter position (see page 90-91)
  Difference in the case of free project design:
  Operating command is adjustable -> Blind/shutter UP, Blind/shutter DOWN, Edit blind/shutter, no function
- Value transmitter (see page 93)
  Difference in the case of free project design:
  Operating command is adjustable -> Transmit value, Edit (preset value via the keyboard), no function
  Display is adjustable -> The status text can optionally display the value transmitted or returned (only advisable if feedback object is present).
- Light scene recall (see page 104-105)
  Difference in the case of free project design:
  Operating command is adjustable -> Recall scene, no function
- Operating mode switchover 4 x 1 bit (see page 106)
  Difference in the case of free project design:
  Operating command is adjustable -> Activate comfort, Activate standby, Activate night reduction, Activate frost/heat protection, Previous operating mode, Next operating mode, no function
- Operating mode switchover KNX (see page 109-110)
  Difference in the case of free project design:
  Operating command is adjustable -> Activate comfort, Activate standby, Activate night reduction, Activate frost/heat protection, Activate automatic, Previous operating mode, Next operating mode, no function
- System date/time (see page 117)
- KNX time (see page 118)
- KNX date (see page 119)
- ASCII text (see page 120)
- Collective feedback (see page 122-123)
- Dimmer actuator load type (see page 125)
- Restraint (see page 113-114) Difference in the case of free project design:
  Operating command is adjustable -> ON, OFF, TOGGLE, Restraint ON, Restraint OFF, no restraint, no function
- Internal page recall (see page 116)
- connect to function...
  The only purpose of this function is simplify and speed up the project design of the elements within the free project design. This function is not available in the predefined project design.
  An identifier can be assigned to elements under the function parameter "Identifier", e.g. Page 1 - switch element". As soon as the function "Connect to function..." is selected for a further element, a selection field opens. This field contains all the elements that have already been created with the note "Connect to:" and their identifier. This, for example, is how the element "Link to: Page 1 - switch element" is found.
  After a previously created and configured element is connected to via the function "Connect to function...", these two elements will be linked together from this time on.

ⓘ If two elements are connected to each other via the function "Connect to function...", care must be taken to ensure that any changes made to one of these elements are also applied in the parameters of the second element! No information to alert the project engineer about this fact once again will appear in the project design tool.

Elements of the free configuration can be linked to other free elements on the same page or on other pages as required. In this way, it is possible to link any number of elements to the function of an an existing element. Such a link is normally recommended if KNX functions - for example the activation of a light - have several operating and display elements due to a particular graphical characteristic (figure 56). The project design is then simplified since only objects and communication parameters - if present - have to be set for a function. In addition, the system resources are saved in this case.

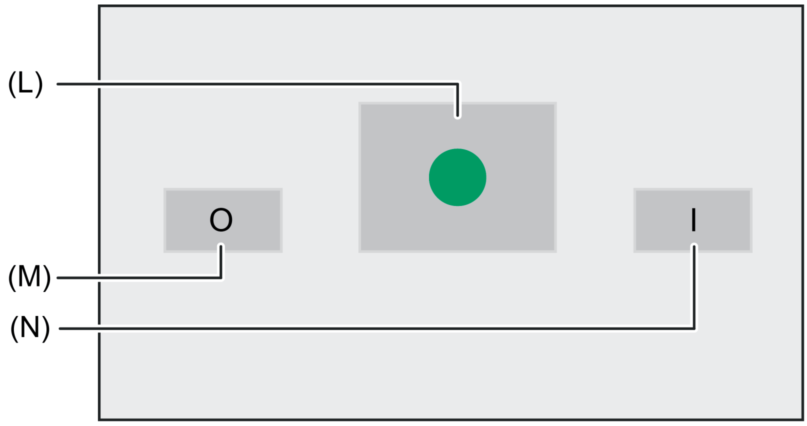


Figure 56: Example of a connection of 3 elements with the same function

(L) First element (e.g. "Switching" function), executed here as a display element

(M) Second element, executed here as an operating element for switching off. Connected to the first element.

(N) Third element, executed here as an operating element for switching on. Connected to the first element

It is possible to identify which elements are functionally connected to each other by means of the "Identifier" parameter. A text name, which is identical for all interconnected elements, is displayed in this parameter. The elements are equal to each other in terms of function. The communication parameters and objects are identical for all connected functions. Consequently, these characteristics only need to be adjusted on one element. The operating commands and display information can be configured differently, however.

Representation of an element for display or operation

Different parameters of a free element specify the representation of the static and dynamic contents. An element of the free project design has the following representation options...

- Text:
  Each element can contain a static text for labelling, thereby enabling the user to identify the operable or readable function easily (e.g. "switch ceiling light"). The horizontal and vertical position of this text label can be specified within the element. In addition, the font colour and font (incl. size and labelling) can be configured.
- Icon:
  Each element provides the option of displaying a status icon. Depending on the configured function of the element, this icon can change state dynamically depending on the object values (e.g. on "switching", separate icons for the 1-ON and 0-OFF states) or remain statically displayed. The horizontal and vertical position of these icons is always identical and can be defined in the configuration of an element.
  In the case of functions that cannot represent a state just with "1" or "0", only an icon can ever be configured. For functions with "1" or "0" states, 3 icons can always be configured. The icon without a state is only visible in this case if the state of the display function is undetermined (for example, after a device restart).

ⓘ The icons specified in the configuration software, and thus integrated in the project design of the device, are copied to a special project directory. When saving the configuration, icons are also written to the project file, in order to be available in other PC environments as well.

ⓘ During commissioning, the icons are transferred to the device in the original file size and stored in the device memory. To avoid having to commit large amounts of storage resources for individual icons, the size of the icons and images should be adapted to the display size of the screen in the display elements.

- Value:
  Elements of the free project design can - just like the display areas of the predefined functions - display status texts or status values. Just like the icons, these status texts or status values can be positioned horizontally and vertically in the element. In addition, the font colour and font (incl. size and labelling) can be configured.
- Background colour:
  Each element can be assigned its own background colour. The presetting is performed in the scheme "RGBA" (incl. alpha for the transparency), in greyscales or on the basis of predefined patterns. Colour gradients can also be adjusted. A colour palette makes it easier to adjust the colours in the configuration software. Transparency is then necessary when elements cover other elements or contents of the background image of the page should remain unchanged in the display.
  Elements can change the background colour during an operation. For this purpose, a "Background colour on pressing button" must also be defined in the configuration software.

ⓘ It should generally be noted that a background colour or texts of an element can be covered by the icons.

4.2.4.5 Settings

A distinction is made between the various settings in the configuration of the device or individual functions. The general device parameters are already set in the configuration software before commissioning. These parameters relate to global device functions (e.g. display illumination, date/time) or to configuration and communication characteristics (e.g. group address structure, managed storage devices).
The general parameters are supplemented by user and system settings that the user can set or just simply view during operation of the device (e.g. e-mail settings, setting the screen brightness, system information). These settings are available in the function view of the main menu level (predefined display structure) (figure 57) when the tile with the ⚙ symbol is pressed (1.). The display then branches to the submenu "Settings" that displays a list of all available user and system settings. To return to the main menu level, press the icon "‹ Functions" (2.) on the settings page in the status line at the top edge of the screen.

ⓘ Some device parameters that were predefined in the configuration software can be subsequently changed directly on the device during operation in the submenu of the settings.

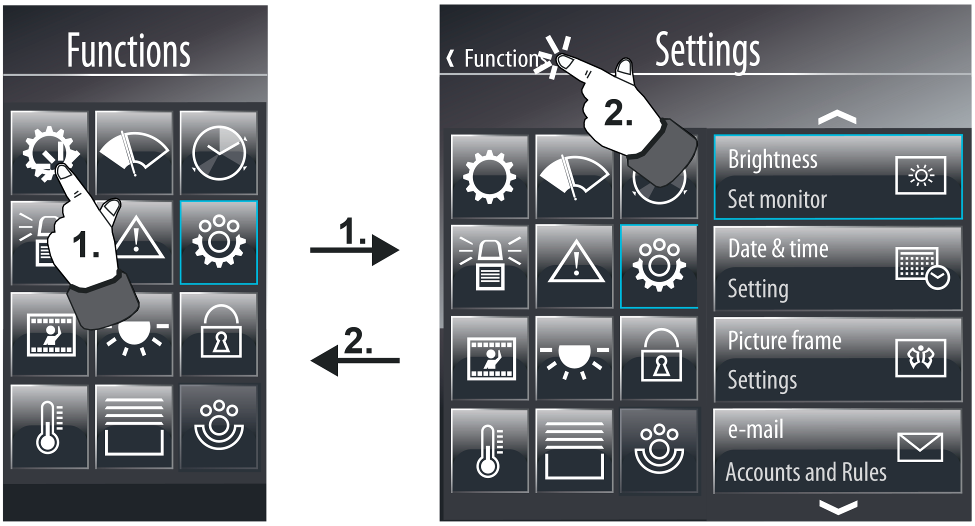


Figure 57: Recalling user and system settings via the function view of the predefined display structure

4.2.4.5.1 General device parameters

General

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "General"...

- "Group address view":
  This parameter defines whether group addresses created in the configuration software and thus used in the device configuration are performed in two or three stages. The setting of this parameter must be adjusted to the setting of the group address structure of the ETS project (e.g. ETS project three-stage = group address view in the configuration software three-stage)! Otherwise, it is not possible to transfer group addresses from the ETS. An ETS4 or ETS5 project with a free group address structure cannot normally be included in the configuration software.
- "Automatically to the return page", "Return time" and "Return page":
  If, during operation, the device is not operated for a period of time specified by the parameter "Return time (1...120 s)", there may be an automatic jump back to a defined display page. For this purpose, the parameter "Automatically to the return page" must be set and the desired display page configured in the parameter "Return page".

- "Page after device restart":
  The device initialises after switching on the mains power supply or after a programming operation. During this time a Start screen is shown on the display. After initialisation, the device automatically displays the screen page specified using the "Start page" parameter "Page after device restart".
- "Application language":
  This parameter defines the language used to depict the display texts predefined by the manufacturer.
- "Status poll delay between start" and "Status poll delay after start":
  The parameter "Delay between status polls" defines the waiting time between individual status polls of the device. This parameter helps to limit the bus load during initialisation. The parameter "Status poll delay after start" defines the waiting time before the device starts reading out values of other communication objects in the case of a status poll after initialisation. This parameter gives other devices time to initialise.
- "Telegram acknowledge":
  A display element usually shows the current value of a communication object (e.g. ON or OFF). If the communication object - normally in a feedback object - does not have a valid value, the display element will then just show a line of dashes "--" rather than the value in the display element.
  Even if the device does not receive an acknowledgement of another KNX bus subscriber - for example due to the operation of a display element - it displays this undefined status.
  The "Telegram acknowledge" parameter allows you to use the "Not required for status display" parameter to show a self-sent value, even without a valid acknowledgement.
  Caution: this setting may cause the device to display values which deviate from the real status in the KNX system. Such cases may occur, for example, if a device has a longer initialisation phase and cannot react to telegrams during this period.
  With the setting "Required for status display", an external acknowledgement of a sent telegram is always required until the device displays a valid value in the display element.
- "Number of managed removable storage devices":
  Commissioning of the device is possible via the Ethernet interface (IP) or via memory access (USB memory stick). The import of new configuration data takes place directly on the device in a menu specially provided for this purpose in the user and system settings. During an import, the source of the data you want to import must be specified. These are removable storage devices. The same applies to a project data export.
  The number of removable storage devices displayed is limited to ensure that the device does not offer the user an unlimited number of drives on the screen in the submenu of the project data import. The device does not offer more than two storage devices on the screen.

Display illumination

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "Display illumination"...

- "Display illumination":
  Depending on the required installation location and the light characteristics, it may be necessary for the display to be illuminated permanently or just temporarily. In the "Continuous operation" setting, the background lighting is always switched to work brightness. It cannot be switched, either via the device or the bus. In the "On actuation" setting, the background lighting is reduced to the set basic brightness value after the defined time set in the configuration tool ("Settings" -> "Display illumination" -> "Length of display illumination...") has elapsed. This means that the background lighting may even be switched off. The basic brightness is set in the Jung GUI Designer or in the Brightness menu ("Settings" -> "Brightness" -> "Standby") directly on the device. As soon as the device is operated via the touch screen, the lighting returns to the configured work brightness. After the set "Display illumination time", the lighting returns to the set basic level of brightness. In the "On actuation or switching object" setting, the lighting is adjusted to the set basic brightness value when idle. When the touch screen is actuated or when a switching value is received via the "Display illumination" communication object, the lighting temporarily switches to the work brightness for the configured "Duration of display illumination". In addition, the lighting can also be switched off at any time via the object. The telegram polarity of the lighting object can be configured.
- "Duration of display illumination":
  This parameter defines the length of the switch-on time of the display illumination in the event that the lighting is activated when pressed or by the communication object.
- "Basic brightness (Sleep)":
  An dieser Stelle wird festgelegt, wie hell die Displaybeleuchtung nach Ablauf der im Konfigurationstool ("Einstellungen" -> "Displaybeleuchtung" -> "Dauer der Displaybeleuchtung...") definierten Zeit ist (keine Bedienung, nicht über das Kommunikationsobjekt eingeschaltet). When the basic level of brightness is set to "100 %", the display for all the settings of the "Display illumination" parameter is always at maximum brightness!
- "Work brightness (Wake)":
  This parameter defines how bright the display illumination is in the operating state (operation, switched on via the communication object, continuous operation).

ℹ After commissioning the device, the "basic brightness" and "work brightness" parameters can be changed directly on the device in the user and system settings ("Standby" and "Operation").

ℹ When the "Time to idle" is set with a smaller value than the "Length of display illumination", then the standby brightness is set in the background. However, the user will not notice any change in the display, as the display is switched off in the idle state.

Date / Time

The device has an integrated real time clock (RTC). This clock is used both to display the current time and date but also to control the timer switch channels or the presence simulation. The clock can be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001) or via the user and system settings directly on the device.

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "Date / Time"...

- "Date display format" and "Time display format":
  These parameters defined the representation of time and date.

The other parameters of the device's internal system clock differentiate themselves depending on the use as master (transmitting date and/or time to the bus) or slave (receiving date and/or time from the bus).

Use as slave clock (Slave):
In most cases, within a KNX system, a device is sufficient which transmits the current time and date at regular intervals, so that all the other devices can synchronise themselves as required. If possible a device should be used which has high accuracy through the reception of the DCF 77 time signal.
The integrated real time clock of the device can be set by such an external clock. The parameter "Comparison with external clock" specifies whether the time and / or date are to be synchronised. Then, if necessary, the two communication objects "Master date" and "Master time" are created. In addition, the device can use the 1-bit communication object "Request date / time", in order to synchronise itself. This communication object transmits - if enabled in the parameters - a request telegram after each device initialisation and then regularly once a day at 4:00 a.m. The telegram polarity can be configured in the configuration software.

Use as master clock (Master):
If there is no opportunity for external bus synchronisation, then the device can transmit the date and time to the bus once a day, once an hour or once per minute (depending on the parameters) in order to synchronise other KNX devices. The parameter "Use as master clock" must be set for this purpose. The values are then transmitted using the objects "Date" and "Time". In this case, the transmission behaviour can be defined as follows...

- Parameter "Transmit on request":
  In this configuration, there is an additional 1-bit communication object with the name "Request date / time through external device" available. When the internal clock receives a switching telegram from another KNX bus subscriber via this object, it evaluates the telegram as a request and transmits the current date and its own time to the bus as a response. The telegram polarity of the external data and time request can be configured.
- Parameter "Transmit date / time cyclically" set:
  The device transmits the date and/or time to the bus cyclically. The parameter "Cycle time for date/time transmission" defines the frequency of transmission.

ⓘ It is possible to use the master and slave function of the internal clock in parallel. These functions are not mutually incompatible. For example, the device can receive the date and time from a KNX master clock and also synchronise other external bus subscribers.

ⓘ The "Date" and "Time" objects can be read out regardless of the cyclical transmission or any time by a poll (set "Read" flag).

The data point types "Date" (11.001) and "Time" (10.001) do not contain any information about whether summer time or normal time (winter time) is currently active. For this reason, the summer-/wintertime changeover can take place automatically. In the submenu "Settings" on the page for configuration of the time zone, it is necessary to set whether or not an automatic changeover should take place.

As an alternative to a synchronisation of the internal clock via KNX bus telegrams, the clock module can be set and synchronised via the Ethernet interface. For this purpose, the device can address an SNTP time server (SNTP = Simple Network Time Protocol). A time server – usually controlled by a very precise time standard – checks the current time to the exact second and the current date. The SNTP is integrated in the TCP/IP so that the time servers in the Internet can also be addressed. The device needs the IP address of any time server (preferably a server in the same time zone) to be able to initiate an SNTP request. The configuration of the SNTP time server also takes place in the Windows® operating system in the date and time properties.

Disable device

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "Disable device"...

- "Device can be disabled via object":
  This parameter determines whether the device can be disabled globally. A disabled device displays a disabling logo on the screen (optional) and can execute a special disabling function if required. All other display and operating functions are then out of operation.
  If the disabling function should be used, the parameter "Device can be disabled via object" must be set.
- "Disabling logo":
  A globally disabled device can optionally display a disabling logo in the centre of the screen. Thus, it is possible to indicate to the operator that the device cannot be operated at the moment or only to a limited extent (see Disabling function). If no logo is used, the device just simply switches the screen to grey.
- "Behaviour of disabling object":
  This parameter predefines the telegram polarity of the object for the global disabling of the device.
- "Disabling function - Press action"
  A globally disabled device can execute a special operating function if necessary (e.g. switch lighting for cleaners). This parameter defines the function and - if necessary - the data format of the disabling function. These settings are possible: "Switching", "Value" (1-byte, 2-byte, 4-byte) and "internal light scene" (recall).
  Additional parameters (transmission value etc.) may possibly be available depending on this parameter setting.

ⓘ A disabling function only implements one operating function. Display elements (such as for the feedback of a switching or brightness state) are not available.

ⓘ On value: The visible parameters "Display format", "Offset", "Factor", "Minimum value" and "Maximum value" dependent on the set data type only format the input field of the transmission value and thus make the value input easier.

e-mail

If the device is connected to a network via the Ethernet interface, the e-mail function can be used. e-mail is a service in computer networks allowing electronic messages to be exchanged between a sender and one or more recipients. Alongside the World Wide Web (www), e-mail is the most currently used service on the Internet.

The device is also able to send e-mail messages by using the SMTP protocol. To use this function, the device operator must have a valid e-mail account in a local network or the Internet. Most Internet Service Providers (ISP) usually offer their customers e-mail accounts.

The configuration of the e-mail account takes place fundamentally in the configuration software with the general device parameters and can be changed to a limited extent at any time directly on the device in the user and system settings. In this way, the device operator can configure his e-mail account at any time and independently of the ETS or configuration software.

The general device parameters are available in the configuration software when the entry "Settings" is selected in the project bar. In the structure view, the following parameters are then available in the entry "E-Mail"...

- "Port":
  Sending of e-mails takes place by the SMTP protocol via a specific port address. This is defined as "25" by default. To allow the SMTP port address to be adapted to the available services, especially in administered networks, it is possible here to enter the necessary port address in the configuration.

- "Authentication" and "Password":
  At this point, it is necessary to specify whether the addressed SMTP server requires authentication. If this is the case, it is also necessary to configure a valid password for the outgoing mail server.
- "Encryption":
  An e-mail can be sent encrypted. Some SMTP servers require a specific type of encryption. This parameter defines the encryption type used by the device when sending an e-mail to the specified e-mail account. The encryption can be deactivated optionally (setting "none").
- "Username":
  The username of the e-mail account must be specified here. This name is used to log in to the SMTP server.
- "Sender":
  This parameter specifies the sender address entered automatically into the sender address field by the device when sending an e-mail.
- "Server name":
  Here the name of the SMTP server is specified in the form of a URL (e.g. "smtp.example.de"). Alternatively, it is also possible to directly specify the IP address of the server.

ⓘ To ensure that the device can send e-mails, the IP settings in the "Network" submenu must be configured correctly. This includes the device's own IP address, the sub-network mask, the addresses of the standard gateway (e.g. Internet router) and a valid DNS server as well as settings for an optionally available firewall or proxy server.

4.2.4.5.2 User and system settings

Service address

The service address is available in the submenu "Settings" (figure 58). The service address is shown on the display of the device by pressing the corresponding operating element (1.) in the submenu. The name of the operating element (e.g. "Service address") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "❬ Back" (2.) on the page of the service address in the status line at the top edge of the screen.
In case of any problems in the KNX system or with the device, users can contact the service address. The information displayed, e.g. a company name and address data in up to 5 lines (A), is predefined in the configuration software as a parameter in the path "Structure view -> Functions -> Settings -> Service address". These cannot be changed later directly on the device. Optionally, it is possible to display a company logo (B).

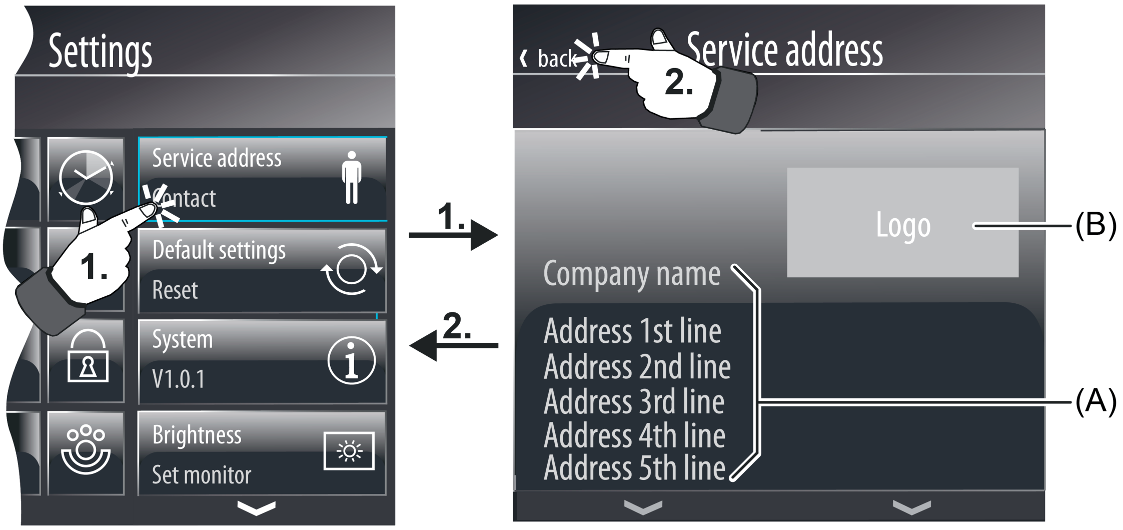


Figure 58: Example of displaying a service address

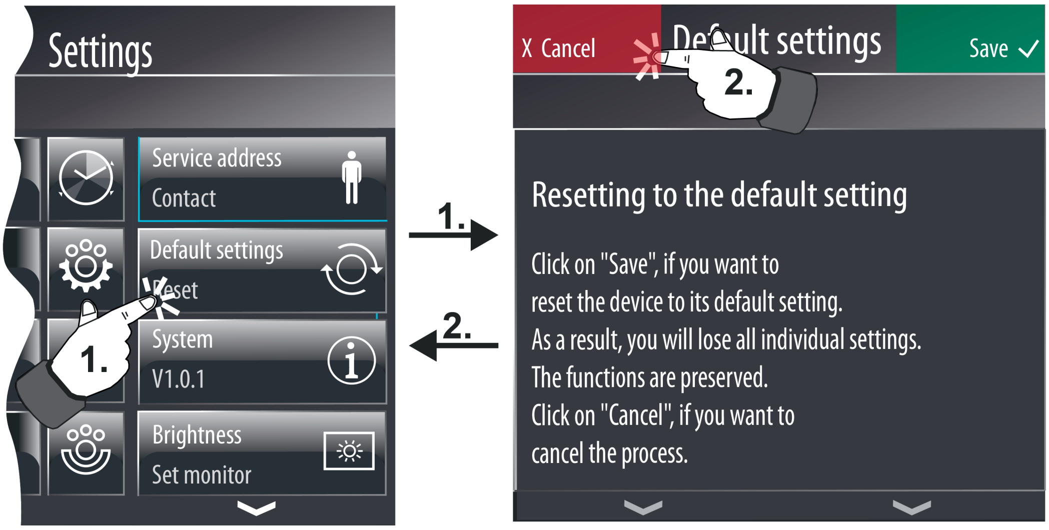
(A) Text display e.g. for company name and address
(B) Position and size for logo

ℹ The company logo specified in the configuration software is copied to a special project directory. When saving the configuration, this logo is also written in the project file in order to be available in other PC environments as well. During commissioning, the logo is transferred to the device in the original file size and stored in the device memory. To avoid having to commit large amounts of storage resources, the size should be adapted to the display size of the screen (approx. 180 x 110 pixels) as much as possible.

Default settings

In the user and system settings it is possible to reset the device to default settings (figure 59). To do this, press the corresponding operating element (1.) in the submenu "Settings". The name of the operating element (e.g. "Default settings") can be predefined in the configuration software.
After opening the page, it must be decided whether or not to actually reset the device to the default settings. If the red coloured control surface "X Cancel" in the status line at the top edge of the screen is pressed (2), all current settings are preserved. After that, the display will return to the submenu "Settings". If, however, the green coloured control surface "Save" is pressed, the device will then reset itself to its default settings. As a result, all user-specific settings configured directly on the device (e.g. switching times of the timer, scene values, transmission

values of transmitter functions) will be lost! Functions and parameters defined in the configuration software are preserved.


Settings
Service address
Contact
Default settings
Reset
System
V1.0.1
Brightness
Set monitor
1.
2.
X Cancel
Default settings
Save ✓

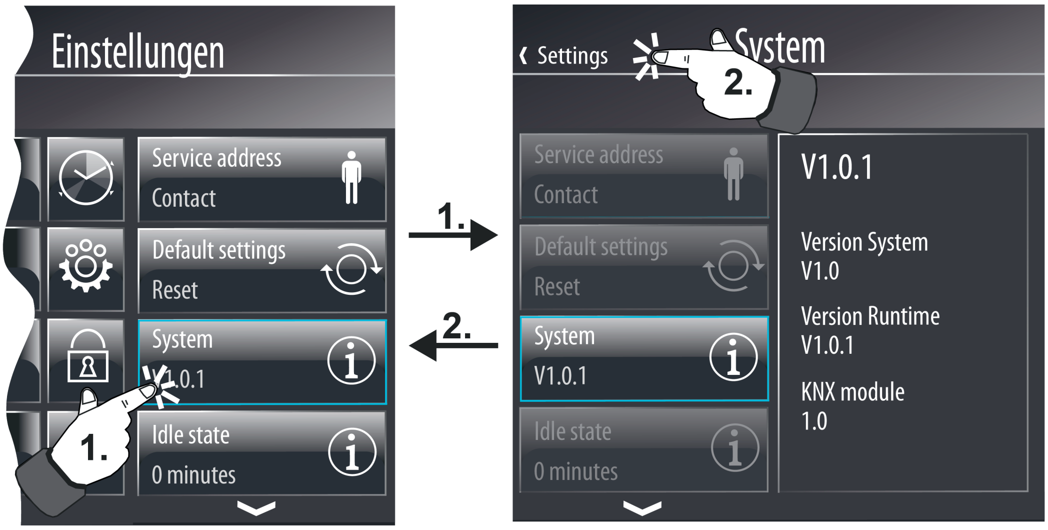
Resetting to the default setting

Click on "Save", if you want to reset the device to its default setting. As a result, you will lose all individual settings. The functions are preserved. Click on "Cancel", if you want to cancel the process.

Figure 59: Page for resetting to default settings

System information

In the submenu "Settings", general system information can be displayed (figure 60). These can be important, for example, during device support. If the corresponding operating element is pressed in the submenu (1.), the system information appears in text form. The name of the operating element (e.g. "System") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "〈 Settings" (2.) on the page of the system information in the status line at the top edge of the screen.


Einstellungen
Service address
Contact
Default settings
Reset
System
V1.0.1
Idle state
0 minutes
1.
2.
〈 Settings
System

V1.0.1

Version System
V1.0

Version Runtime
V1.0.1

KNX module
1.0

Figure 60: Page for displaying the system information

Idle state

In the submenu "Settings", the time until the idle state occurs can be configured (figure 61). It is possible to configure the time that should elapse before the idle state becomes active. A time interval from 0 to 120 minutes can be set. During the idle state, the display of the device is

switched off. Actuating the display reactivates the product.
If the corresponding operating element is pressed in the submenu (1.), the elements for displaying and setting the "Time until idle state" appear. The name of the operating element (e.g. "Idle state") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "〈 Settings" (2.) on the page of the system information in the status line at the top edge of the screen.

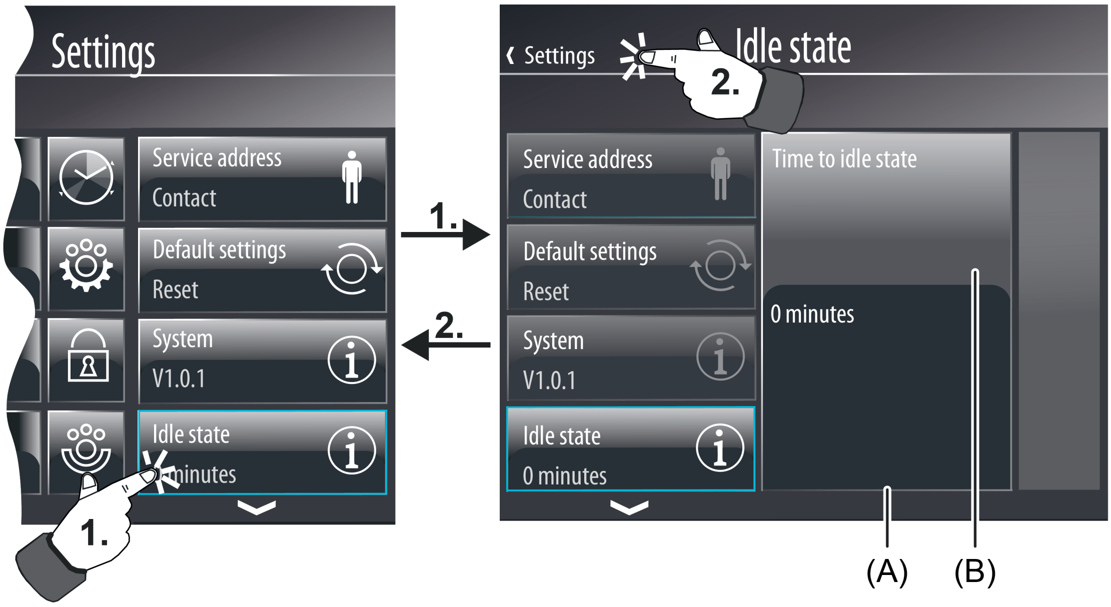


Figure 61: Page for setting the "Time until idle state"

(A) Display and control element of the "Time until idle state"

(B) Display element of the "Time until idle state"

Brightness of the display illumination

In the submenu "Settings", the display brightness can be configured (figure 62). In this way, it is possible to later change the work brightness for operation and the basic brightness for standby originally specified in the configuration software and thus adapt to the user's individual needs. The basic brightness for Standby is set after the time set in the configuration tool ("Settings" -> "Display illumination" -> "Length of display illumination [min]") has elapsed.

ⓘ When the "Time to idle" is set with a smaller value than the "Length of display illumination", then the standby brightness is set in the background. However, the user will not notice any change in the display, as the display is switched off in the idle state.

If the corresponding operating element is pressed in the submenu (1.), the elements for displaying and setting the brightness values appear. The name of the operating element (e.g. "Brightness") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "〈 Settings" (2.) on the page of the system information in the status line at the top edge of the screen.

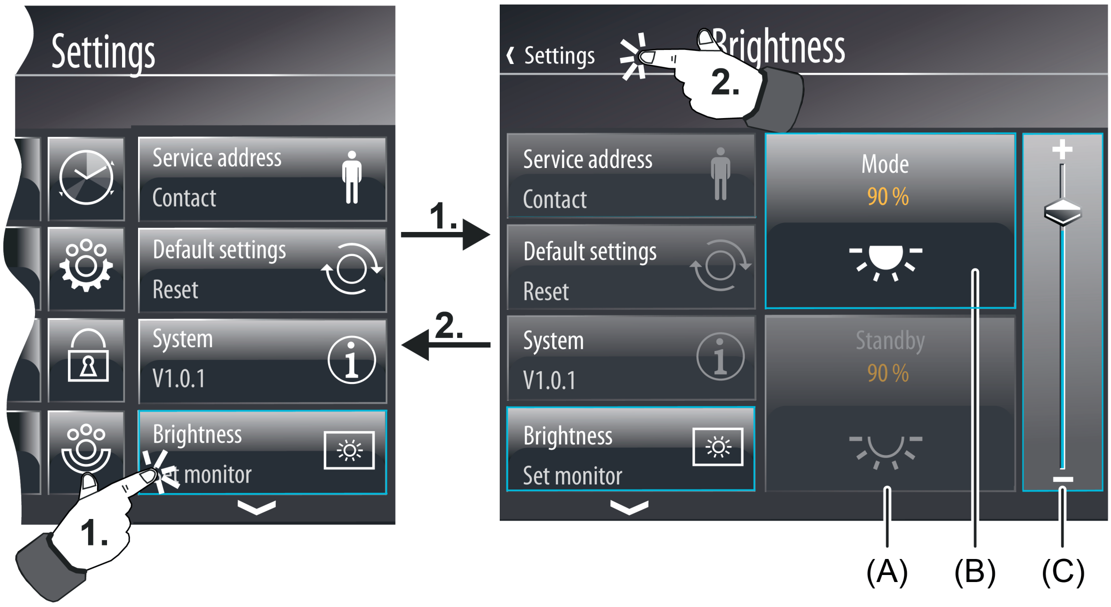

Settings
Service address
Contact
Default settings
Reset
System
V1.0.1
Brightness
Set monitor
1.
2.
1.
2.
‹ Settings
Brightness
Mode
90 %
Standby
90 %
+
–
(A)
(B)
(C)

Figure 62: Page for setting the display brightness

(A) Display element for the basic brightness (standby)
(B) Display element for the work brightness (operation)
(C) Value slider for setting the brightness values

Network

In the "Settings" submenu, network settings can be made (figure 63).
If the corresponding operating element is pressed in the submenu (1.), the elements for displaying and setting the network appear. The name of the operating element (e.g. "Network") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "‹ Settings" (2.) on the page of the system information in the status line at the top edge of the screen.

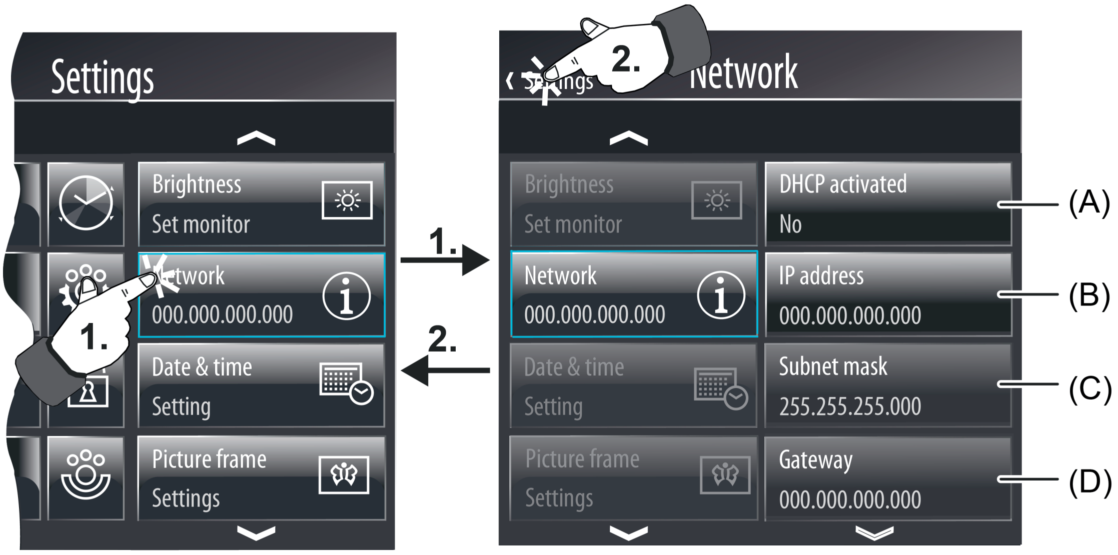

Settings
Brightness
Set monitor
Network
000.000.000.000
Date & time
Setting
Picture frame
Settings
1.
2.
‹ Settings
Network
DHCP activated
No
IP address
000.000.000.000
Subnet mask
255.255.255.000
Gateway
000.000.000.000
(A)
(B)
(C)
(D)

Figure 63: Page for configuration of the network settings

(A) Display and control element for activating the DHCP
(B) Display and control element for setting the IP address
(C) Display and control element for setting the subnet mask
(D) Display and control element for setting the gateway address

Furthermore, the address of the DNS server can be entered in the submenu of the network. In addition to the network settings, a computer name can also be assigned for the KNX Smart Panel 5.1.

ⓘ After activating the DHCP, no more settings can be made in the submenu of the network, except for the change to the computer name, since the network settings are adapted automatically to an existing network.

Date and time

In the submenu "Settings", it is possible to set the time and date of the device's internal system clock (figure 64). This clock is used both to display the current time and date but also to control the timer switch channels or the presence simulation. Furthermore, the corresponding time zone can be selected and the automatic consideration of the summer time and winter time changeover specified. These settings become important, for example, when using the astro function of the timer.
If the corresponding operating element is pressed in the submenu (1.), the page for configuration of date and time is displayed. The name of the operating element (e.g. "Date & Time") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "‹ Settings" on the page in the status line at the top edge of the screen.

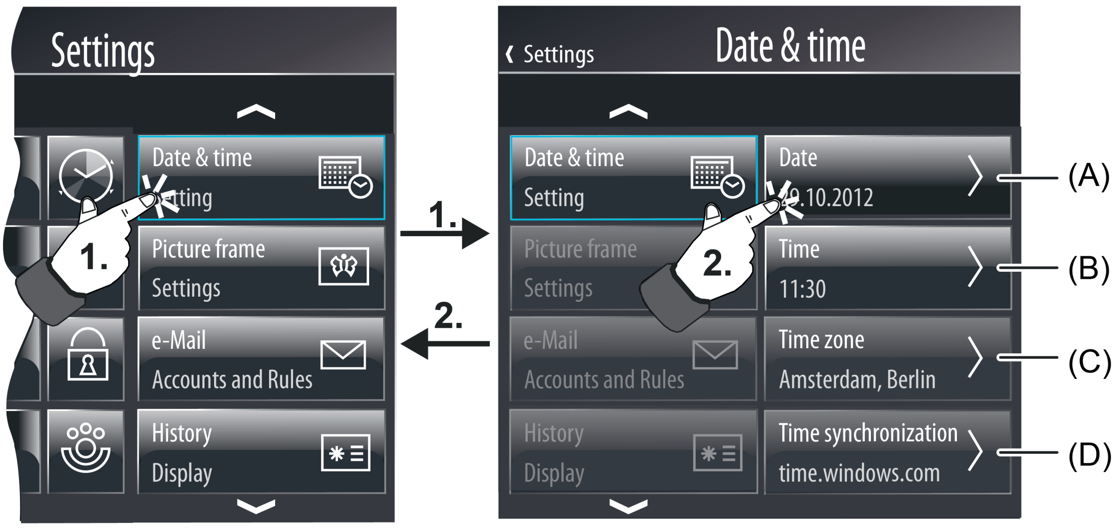

Settings
Date & time
Setting
Picture frame
Settings
e-Mail
Accounts and Rules
History
Display
1.
1.
2.
2.
‹ Settings
Date & time
Date & time
Setting
Date
29.10.2012
Picture frame
Settings
Time
11:30
e-Mail
Accounts and Rules
Time zone
Amsterdam, Berlin
History
Display
Time synchronization
time.windows.com
(A)
(B)
(C)
(D)

Figure 64: Page for setting date, time, time zone and time synchronisation

(A) Button for setting the date
(B) Button for setting the time
(C) Button for setting the time zone
(D) Button for setting the time synchronisation

On the configuration page, you must decide whether the date or time should be set, the time zone selected or a time synchronisation set up. A different control surface is available for each setting (date, time, time zone and time synchronisation). On pressing a control surface (2.), the display branches to another submenu that allows various settings depending on the selection. To return to the configuration page for the date, time, time zone and time synchronisation, press the icon "❬<Name of the page for date & time>" (3.) in the status line at the top edge of the screen.

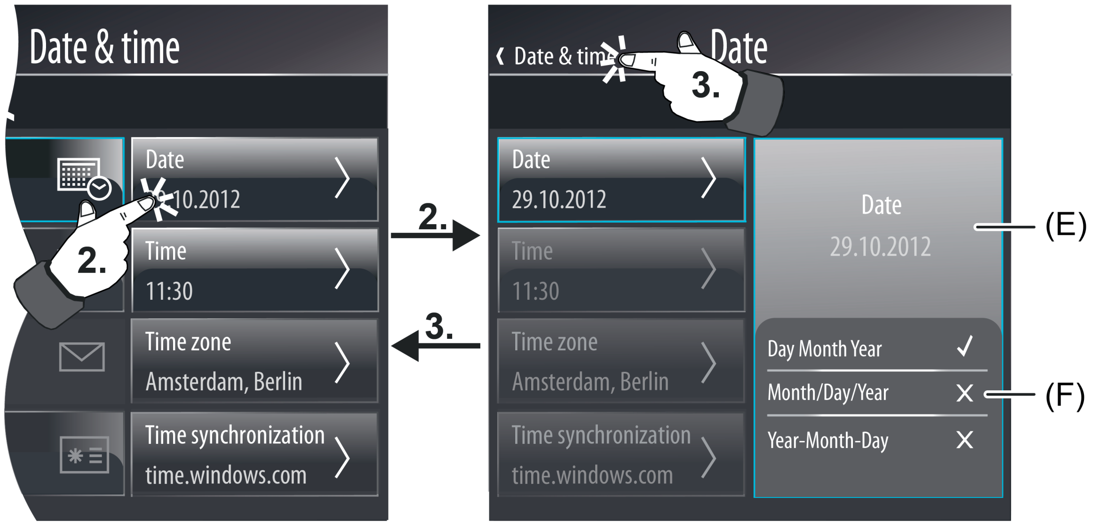

Date & time
Date
29.10.2012
Time
11:30
Time zone
Amsterdam, Berlin
Time synchronization
time.windows.com
2.
2.
3.
‹ Date & time
3.
Date
Date
29.10.2012
Time
11:30
Time zone
Amsterdam, Berlin
Time synchronization
time.windows.com
Date
29.10.2012
Day Month Year ✓
Month/Day/Year ✕
Year-Month-Day ✕
(E)
(F)

Figure 65: Page for the setting and configuration of the date display

(E) Display and control surface for setting the date

(F) Display and control surface for setting the parameters for formatting the date display

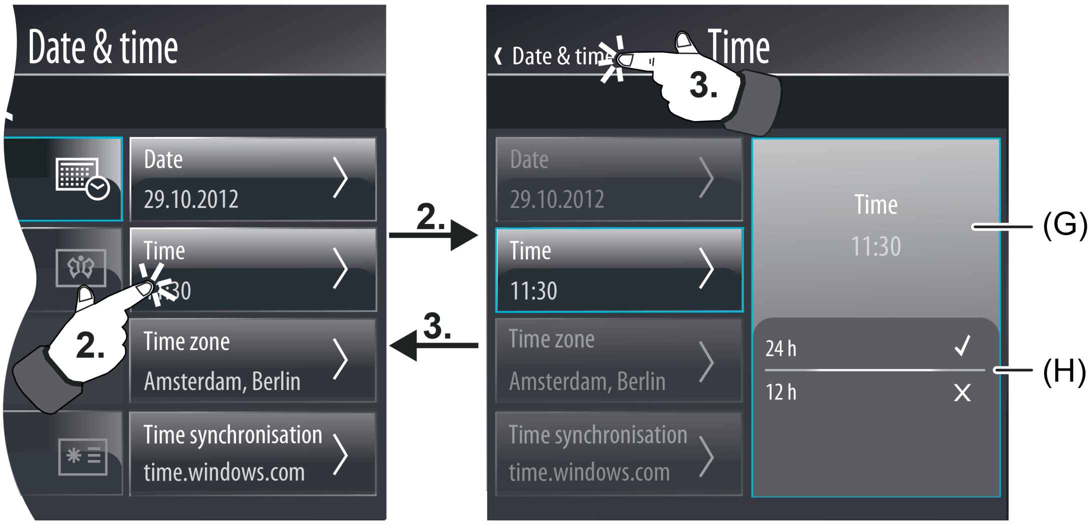

Date & time
Date
29.10.2012
Time
11:30
Time zone
Amsterdam, Berlin
Time synchronisation
time.windows.com
2.
2.
3.
‹ Date & time
Time
3.
Time
11:30
24 h ✓
12 h ✕
(G)
(H)

Figure 66: Page for the setting and configuration of the time display

(G) Display and control surface for setting the time
(H) Display and control surface for setting the parameters for formatting the time display

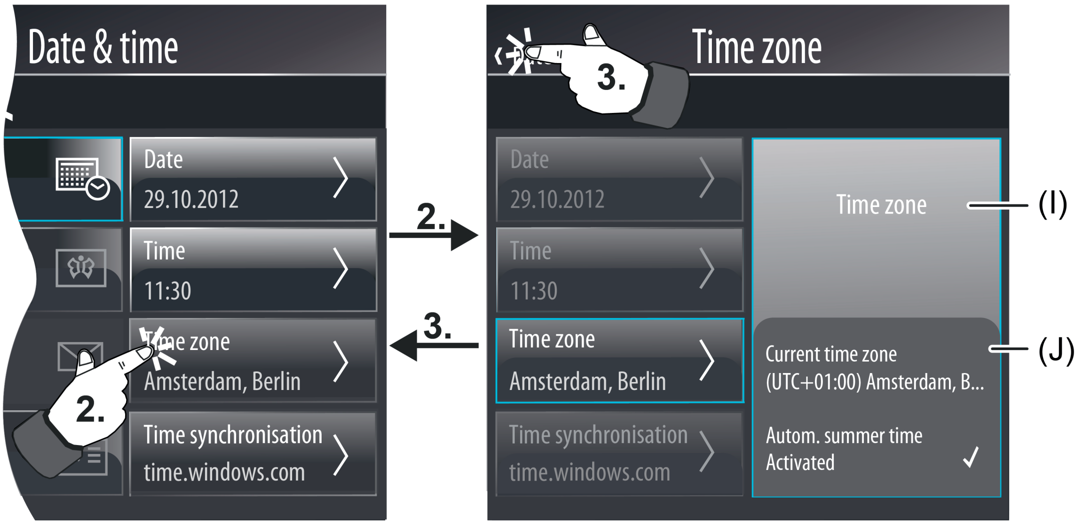

Date & time
Date
29.10.2012
Time
11:30
Time zone
Amsterdam, Berlin
Time synchronisation
time.windows.com
2.
2.
3.
Time zone
3.
Time zone
Current time zone
(UTC+01:00) Amsterdam, B...
Autom. summer time
Activated ✓
(I)
(J)

Figure 67: Page for selection and configuration of the time zone

(I) Display surface for setting the time zone
(J) Display and control surface for setting the time zone

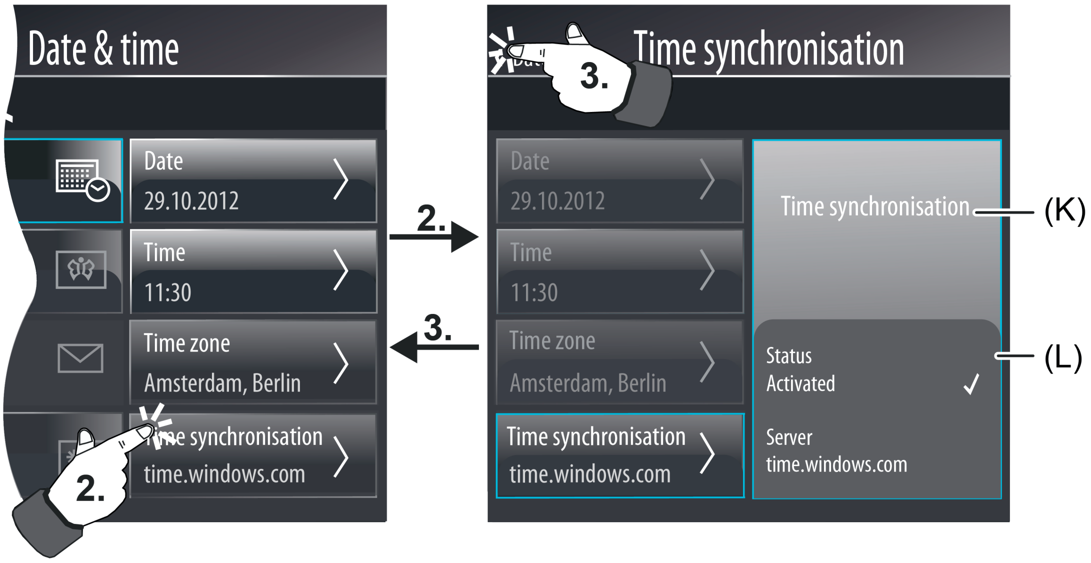


Figure 68: Page for enabling and entering the time synchronisation

(K) Display surface for setting the time synchronisation
(L) Display and control surface for setting the time synchronisation

If the display surface of the date or time (E / G) is pressed for a long time, an on-screen keyboard is displayed with which the date and time can be set. In the display and operating area below this (F / H), display parameters can be defined which determine how the data and time is displayed (✓ = setting selected). These settings are then applied immediately.
In the same way, the time zone as well as time synchronisation can be set by a long button-press on the values currently set. During the adjustment of a time zone, a selection list opens, from which the required zone can be selected. Furthermore, automatic consideration of the summer time and winter time setting can be activated or deactivated in the submenu of the time zone.

ⓘ The coordinated world time (UTC+0h) is the default time zone in the device. An adjustment to the mounting location e.g. for Germany, must be made in the submenu "Settings" -> "Date and Time" -> "Time zone".

ⓘ The deactivation of automatic summer time has no effect on the KNX Smart Panel 5.1 with a Linux operating system. Depending on the time zone set, automatic switch-over between summer and winter time always takes place.

When the currently set server in the submenu of the time synchronisation is pressed for a longer time, a keyboard opens for entering the required server address. In addition, the activation state (activated / deactivated) of the server can be set.

ⓘ The clock can alternatively be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001).

e-mail

If the device is connected to a network via the Ethernet interface, the e-mail function can be used. e-mail is a service in computer networks allowing electronic messages to be exchanged between a sender and one or more recipients. Alongside the World Wide Web (www), e-mail is the most currently used service on the Internet.

The device is also able to send e-mail messages by using the SMTP protocol. To use this function, the device operator must have a valid e-mail account in a local network or the Internet. Most Internet Service Providers (ISP) usually offer their customers e-mail accounts.

The configuration of the e-mail account takes place fundamentally in the configuration software with the general device parameters and can be changed to a limited extent at any time directly on the device in the user and system settings. In this way, the device operator can configure his e-mail account at any time and independently of the ETS or configuration software.

The e-mail parameters are available in the submenu "Settings" (figure 69). If the corresponding operating element is pressed in the submenu (1.), the device displays the e-mail page. The name of the operating element (e.g. "E-Mail") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "❬ Settings" on the E-Mail page in the status line at the top edge of the screen.

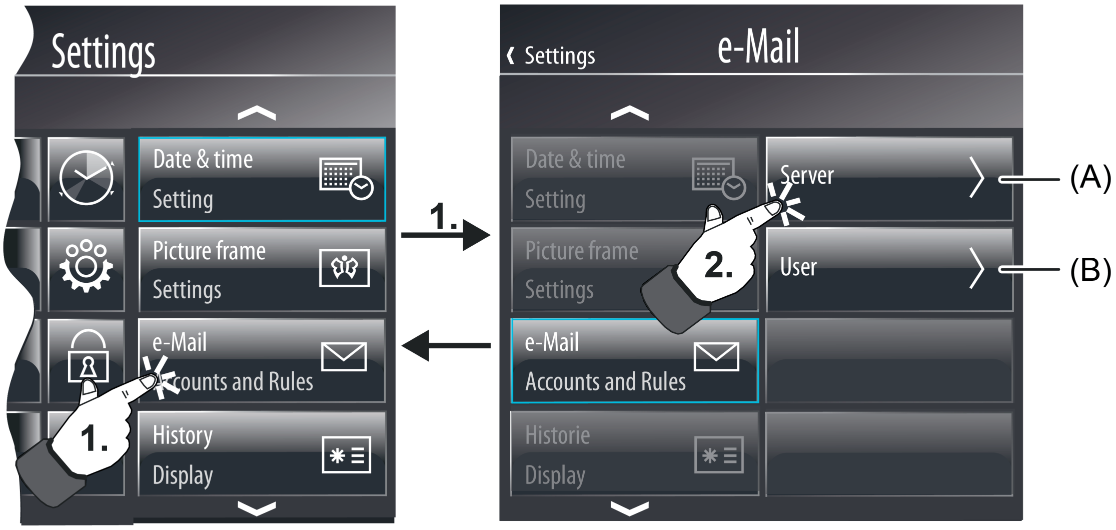

Settings
Date & time
Setting
Picture frame
Settings
e-Mail
Accounts and Rules
History
Display
1.
1.
❬ Settings
e-Mail
Date & time
Setting
Picture frame
Settings
e-Mail
Accounts and Rules
Historie
Display
Server
User
2.
(A)
(B)

Figure 69: Page for setting the e-mail account

(A) Button for setting the characteristics of the SMTP server

(B) Button for setting the user data of the e-mail account

On the e-mail page it is necessary to decide whether characteristics of the SMTP server or user data of the e-mail account should be set. Two different control surfaces are provided for these settings. On pressing a control surface (2.), the display branches to another submenu that allows various settings depending on the selection.
To return to the e-mail page, press the icon " ❬<Name of the e-mail page>" (3.) in the status line at the top edge of the screen.

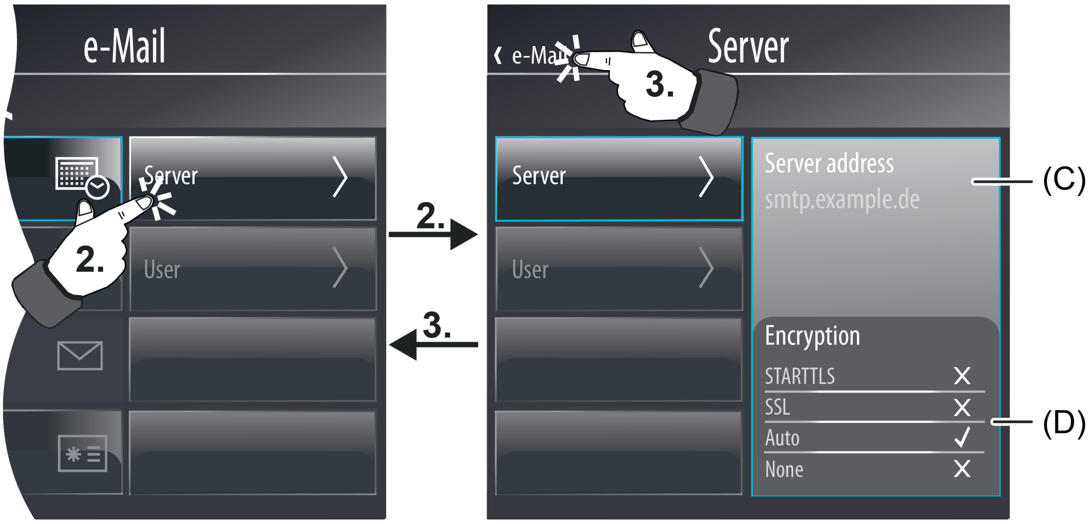

e-Mail
Server
User
2.
2.
3.
e-Mail
Server
3.
Server
User
Server address
smtp.example.de
Encryption
STARTTLS X
SSL X
Auto ✓
None X
(C)
(D)

Figure 70: Page for setting the server characteristics

(C) Display and control surface for setting the SMTP server address
(D) Display and control surface for setting the parameters for the encryption

Server characteristics:
In the display area (C) the name of the current SMTP server is displayed in the form of a URL (e.g. "smtp.example.de") or IP address (corresponds to the parameter "Server name" in the configuration software). If the display surface is pressed for a long time, an on-screen keyboard is displayed with which the server address can be set.
In the display and operating area below this (D) the encryption type required by the SMTP server can be configured (✓ = setting selected). This setting is then applied immediately.

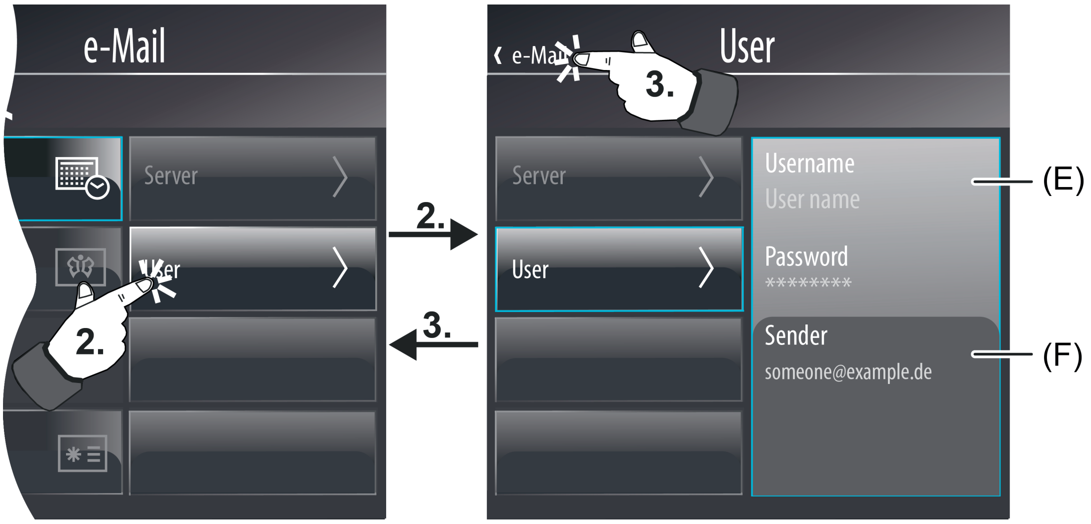

e-Mail
Server
User
2.
2.
3.
e-Mail
User
3.
Server
User
Username
User name
Password
****
Sender
someone@example.de
(E)
(F)

Figure 71: Page for setting the user data

(E) Display and control surface for setting user name and password
(F) Display and control surface for setting the sender address

User data:
In the display area (E) the user name and password are displayed (corresponds to the parameters "User name" and "Password" in the configuration software). If the display surfaces are pressed for a long time, an on-screen keyboard is displayed with which the user name and password can be set.
In the display and operating area below this (F) the sender address can be configured. This setting (corresponds to the parameter "Sender" in the configuration software) specifies the sender address entered automatically into the sender address field by the device when sending an e-mail.

- It is possible to specify an anonymous authentication (=without password) in the configuration software. In this case, the password on the device in the user and system settings is still present (empty text field). A password can be assigned here later if necessary and thus switched over to a password authentication.

- To ensure that the device can send e-mails, the IP settings in the Windows® operating system must be configured correctly. This includes the device's own IP address, the subnetwork mask, the addresses of the standard gateway (e.g. Internet router) and a valid DNS server as well as settings for an optionally available firewall or proxy server.

History

The device stores various events and internal operations in a history list. An event entered in the history list could be a device restart (reset) or a programming operation with date and timestamp. Various error states are also logged in the history list. The history can be important, for example, during device support.

The history is available in the submenu "Settings" (figure 72). If the corresponding operating element is pressed in the submenu (1.), the device displays the history list. The name of the operating element (e.g. "History") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "❬ Settings" on the page of the history in the status line at the top edge of the screen (2.).

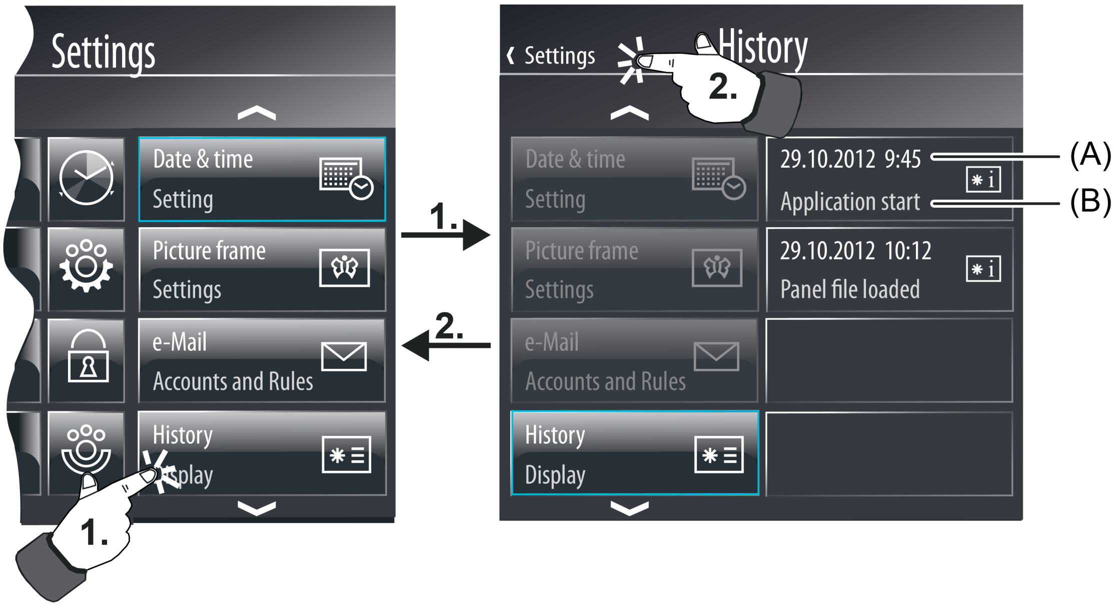


Figure 72: Page for the history

(A) Date and time of the event

(B) Event

Password

The opening of pages can optionally be protected by a password. Up to 4 password levels are available for this in the device. To activate the password protection, a password level must be assigned to a display page in the configuration software. The corresponding page will first then be displayed by an open page request (external or internal open page) if the correct password assigned to the level was entered. The display page of the signalling system and the commissioning by means of IP are protected by their own password levels.

The default passwords of the four levels are (incl. passwords for the signalling system and commissioning function)...

- Level 1: "1111"
- Level 2: "2222"
- Level 3: "3333"
- Level 4: "4444"
- Signalling system: "9999"
- Commissioning: "0000"

The passwords are not defined in the configuration software. They are only saved in the device and must also be changed there. The passwords can be customized in the submenu "Settings" (figure 73). If the corresponding operating element is pressed in the submenu (1.), the device displays the password list. The name of the operating element in the settings menu (e.g. "Password") as well as the names of the operating elements in the password list (e.g. "Level 1") can be predefined in the configuration software. To return to the "Settings" menu, press the icon "〈 Settings" on the page of the passwords in the status line at the top edge of the screen (2.).

Tapping an operating element causes the on-screen keyboard to open in the password list, giving the option of entering and saving a new password.

ⓘ It is advisable to activate the password protection for the display page of the passwords so that the setting of new passwords is protected against unauthorised access. This is done by assigning the display page in the configuration software to a password level.

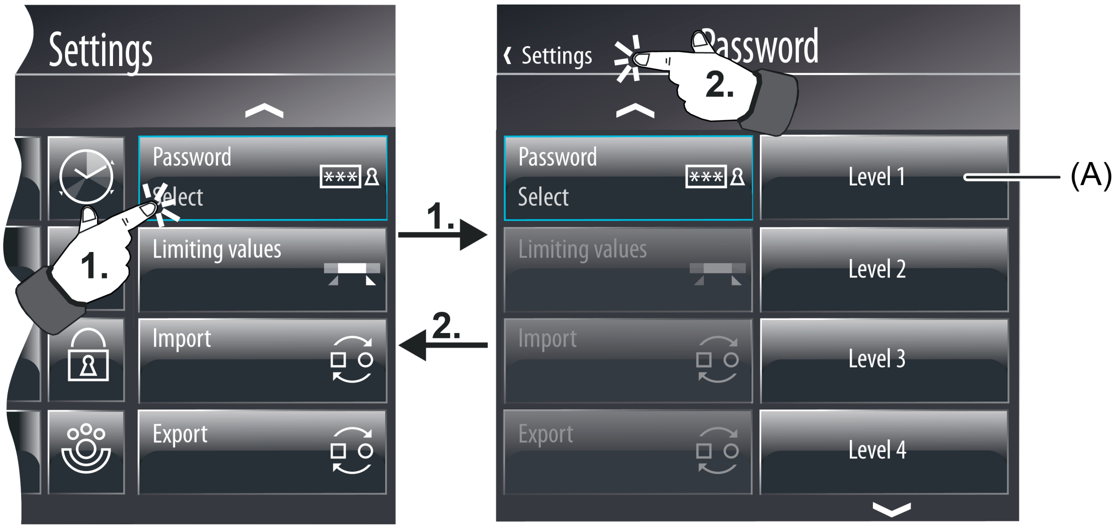


Figure 73: Page for configuration of the passwords

(A) Control surface for setting a new password by a long press ℹ The passwords set directly on the device are not overwritten after a commissioning operation of the device and are not lost after a power failure either.

ℹ Resetting of the passwords - should the page of the password list be protected by a lost password - can be carried out as follows:
Open the corresponding project in the configuration software. Remove the password protection in the parameterisation of the display page for the passwords. Perform commissioning operation. Reassign the corresponding password directly on the device on the page of the passwords and save. Go back into the configuration software and reset the password protection of the display page for the passwords. Perform a commissioning operation once again.

Limiting values

The device allows the limiting value monitoring of 1-byte, 2-byte and 4-byte values in different data formats. A maximum of 40 limiting value modules are available that can be created individually and configured in the configuration software under "Logic Editor". The limiting value modules have one value input object each. The value received via this object is compared continuously with the configured limiting values. Each limiting value module also has two limiting values each with 1-bit communication objects for monitoring a lower and upper limit. Alarm or message telegrams can be transmitted to the bus via these 1-bit objects if the lower / upper limiting value was fallen short of / exceeded.
The limiting values are predefined in the configuration software depending on the set data type of the value object. The limiting values can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the individual limiting values in the configuration software are configured as changeable.

Limiting values can be edited if the corresponding operating element in the submenu "Settings" (figure 74) is pressed (1.). The device then displays a list of all existing limiting value modules. The name of the operating element in the settings menu (e.g. "Limiting value") as well as the names of the operating elements in the limiting value list (e.g. "Limiting value 1") can be predefined in the configuration software (the names of the individual limiting values in the tree node of the logic editor).
To return to the "Settings" menu, press the icon "〈 Settings" on the page of the limiting values in the status line at the top edge of the screen.

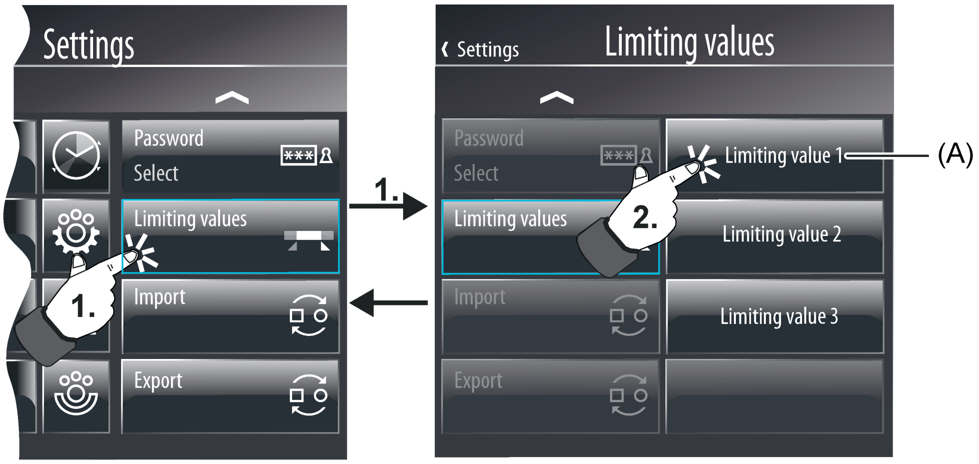

Settings
Password
Select
Limiting values
Import
Export
1.
1.
Settings
Limiting values
Password
Select
Limiting values
Import
Export
2.
Limiting value 1
Limiting value 2
Limiting value 3
(A)

Figure 74: Page for setting limiting values

(A) Control surface for editing a limiting value

On the display page of the limiting values it is necessary to decide which limiting value should be edited. On pressing a control surface (2.), the display branches to another submenu that allows the limiting values of a limiting value module to be set directly(figure 75).
To return to the page of the limiting values, press the icon " ⟨<Name of the page for limiting values>" (3.) in the status line at the top edge of the screen.

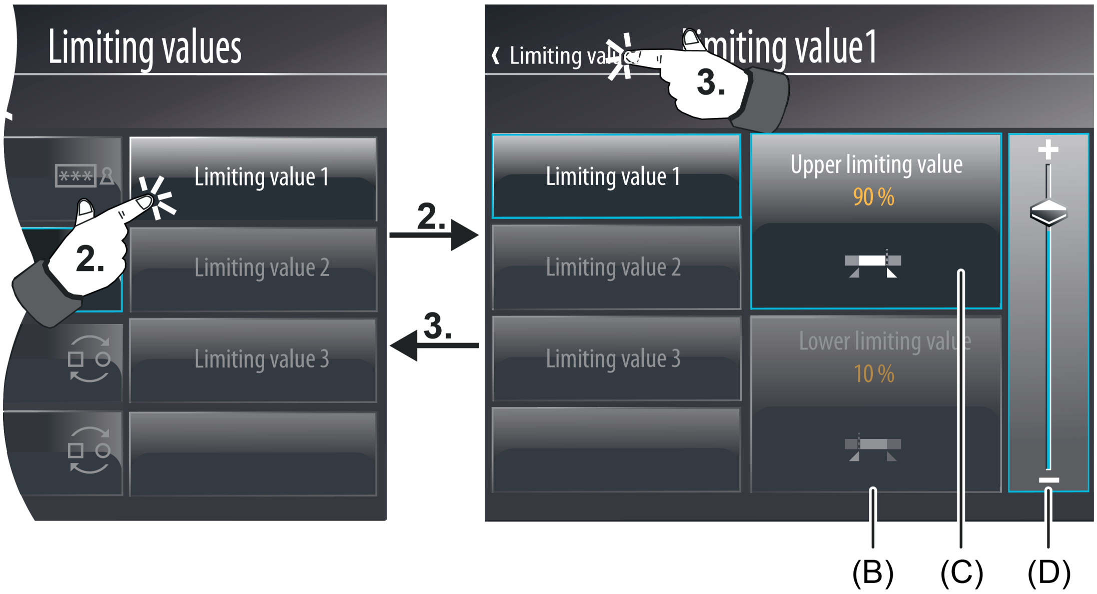


Figure 75: Page for the setting and configuration of the date display

(B) Display element for the active lower limiting value
(C) Display element for the active upper limiting value
(D) Value slider for setting the limiting value (visible if the limiting value is changeable)

ℹ The value slider is only visible, however, if the selected limiting value in the configuration software is configured as changeable. If a limiting value is not changeable, you can only read the limiting value on the display page, but cannot change it.

ℹ The limiting values of a limiting value module (B + C) can be deactivated independent of each other. Deactivated limiting values are not displayed.

ℹ Limiting values can also be optionally changed externally via a communication object.

Import / Export

Commissioning of the device is possible by IP access via the Ethernet interface or alternatively via memory access (USB memory stick, network drive). In the case of commissioning by means of memory access, the project data created in the configuration software and saved in a commissioning file must be imported to the device. This is possible directly on the device in the user and system settings.
The device also offers the option of exporting a project design that is present in the device memory to a file. This is is advisable, for instance, if an existing project design should serve as a template for other devices.

Import of a commissioning file:
The import of a commissioning file is possible in the submenu"Settings" (figure 76) if the corresponding operating element is pressed (1.). The device will then display a file browser with all USB storage devices available in the operating system. The drive containing the commissioning file necessary for the import must be clicked here (2.).

ℹ If the red coloured control surface "X Cancel" in the status line at the top edge of the screen on the page is pressed, the device will cancel the import.

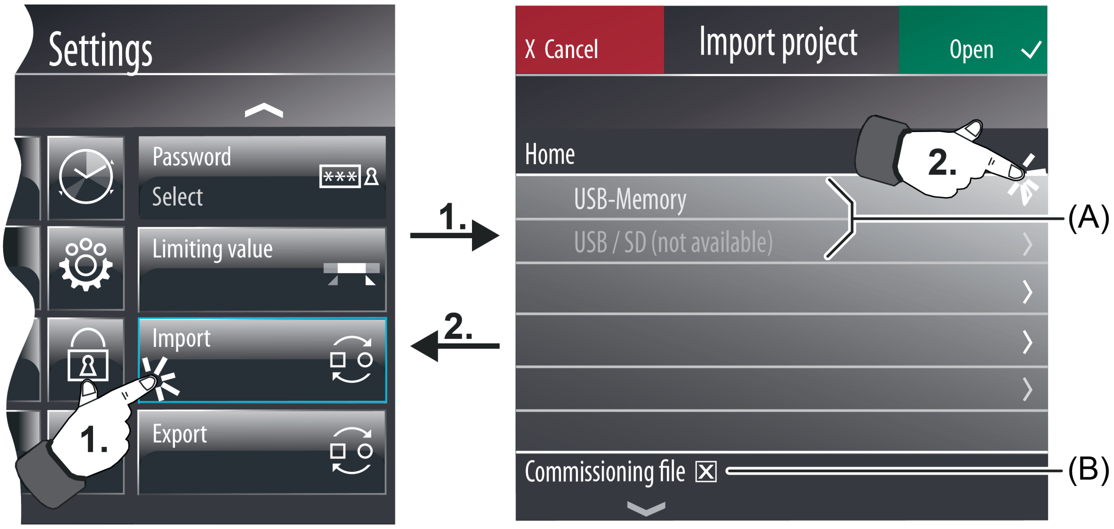

Settings
Password
Select
Limiting value
Import
Export
1.
2.
X Cancel
Import project
Open
Home
USB-Memory
USB / SD (not available)
Commissioning file ☒
(A)
(B)

Figure 76: Page for opening the file browser to specify the commissioning drive

(A) Control surfaces for selecting an available USB drive
(B) Display that only commissioning files are displayed in the file browser window.

ℹ The number of removable storage devices displayed is limited to ensure that the device does not offer the user an unlimited number of drives on the screen in the file browser. The device does not offer more than two storage devices on the screen.

The display then opens the selected drive and displays a list of all folders and commissioning files (file format *.jdct9 and .jd2ct9) contained therein (figure 77).

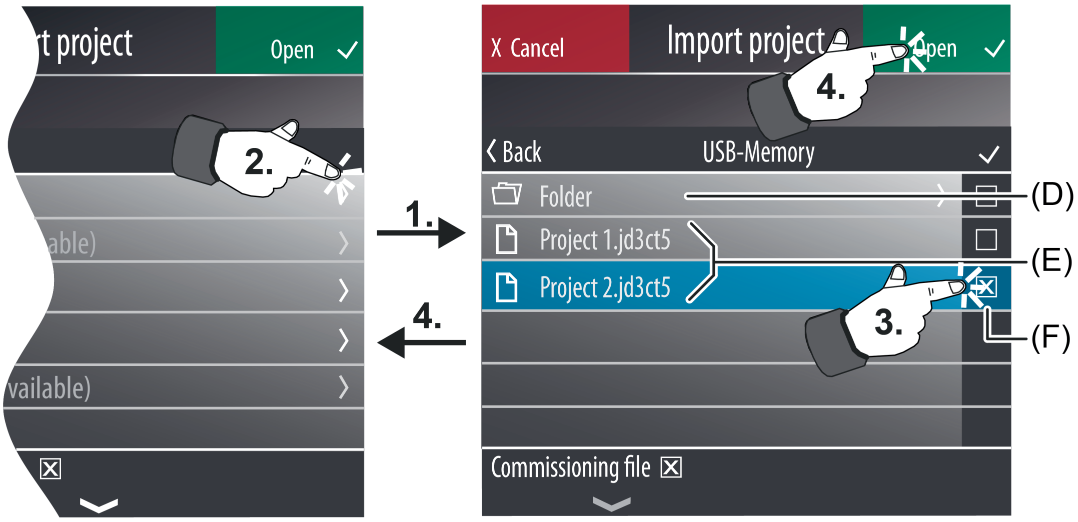

t project
Open
2.
able)
vailable)
1.
4.
X Cancel
Import project
Open
Back
USB-Memory
Folder
Project 1.jd3ct5
Project 2.jd3ct5
Commissioning file ☒
3.
(D)
(E)
(F)

Figure 77: Page for selecting the commissioning file

(D) Operating element for opening a directory or subdirectory in the selected drive
(E) Display elements for existing commissioning files
(F) Operating element as checkbox for selecting the commissioning file to be imported

After selecting the desired commissioning file (only one file can be selected at a time), the green coloured control surface "Open ✓" in the status line must be pressed to perform the import. The import then starts immediately. The progress of the import is shown in the display of the device. After completing the import, the device works immediately with the new configuration data and is ready once again for operation.

ⓘ If the red coloured control surface "X Cancel" in the status line at the top edge of the screen on the page is pressed, the device will cancel the import. As a result, the project design in the device remains valid.

ⓘ Before importing a new configuration file, it is advisable to make a backup of the existing project design by means of an export.

Export of a project file:
It is possible to export an existing project design in the device by pressing the corresponding operating element (Standard: "Export") in the submenu "Settings". The process for selecting the drive and storage location of the project file to be exported is essentially identical to the import process and will not be mentioned here once again. To save a project file, the corresponding storage location must first be selected. The green coloured control surface "Save" in the status line must then be pressed. After that, an on-screen keyboard for entering the file name will open. The save operation is started by pressing the "Enter" button. This might take a few seconds.

4.2.4.6 Fault messages

Fault messages

In contrast to the normal display and operating functions, fault messages have the following distinctive features...

- A specific message page can be displayed irrespective of the current display page (high display priority).
- An acoustic signal can be sounded during an active message.
- The user can demand an acknowledgement.
- Faults can be entered in a separate message list.

4.2.4.6.1 Creating fault messages and the message window

Creating a fault message

Up to 50 different fault messages can be managed in the configuration software. Fault messages are added to the project design in the structure view if the entry "Fault messages" is selected in the project bar. Fault messages there can also contain a specific name.
A 1-bit "Fault signal object" is created for each fault message added. The parameter "Activation by object value" defines when a message is activated via the fault signal object (e.g. activation through "1" telegram). The opposite value deactivates the message (e.g. deactivation through "0" telegram). In addition, a text can be specified for each fault, allowing the fault message to be identified later.

The parameter "Acoustic signal" determines whether the device outputs a signal via the internal signal encoder when there is an active fault message. It is useful to use this acoustic signalling function if fault messages should signal important events or states to the user of the device.

If individual fault messages are particularly important or fault messages can be traced back to similar sources (e.g. smoke detectors), other fault messages that are active at the same time can be disabled in the device. This is done in the parameter area "Exceptions" directly in the configuration software for fault messages that should receive a high priority. Any one of the fault messages configured in the device can always be selected by clicking on the button "Add fault message". These messages are then suppressed and thus receive a lower priority.

Message window

As soon as a fault message is active, a warning symbol appears in the footer of the display screen (figure 78). After pressing the symbol, a message window will become visible. This message window contains an overview of all active fault messages in list form (figure 79). Furthermore, some of the last (inactive) fault messages are also listed in the list.
The warning symbol is highlighted in red if there are fault messages that have not been acknowledged. It turns yellow when all fault messages have been acknowledged but some of them are still active.

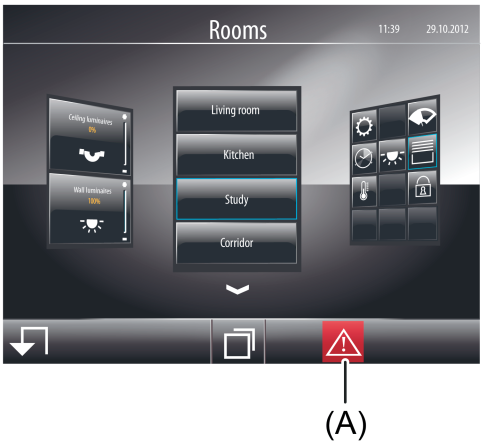
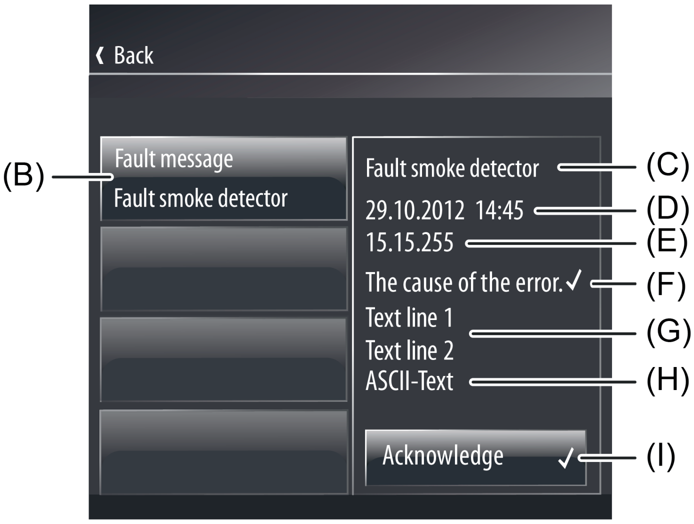

Rooms
11:39
29.10.2012
Ceiling luminaires
0%
Wall luminaires
100%
Living room
Kitchen
Study
Corridor
(A)

Figure 78: Global display of active fault messages

(A) Symbol for active fault messages in the footer


Back
Fault message
Fault smoke detector
Acknowledge ✓
(B)
(C)
(D)
(E)
(F)
(G)
(H)
(I)

Fault smoke detector
29.10.2012 14:45
15.15.255
The cause of the error. ✓
Text line 1
Text line 2
ASCII-Text

Figure 79: Message window

(B) Control surface for recalling more information on fault messages
(C) Name of the fault message (configurable / max 20 characters)
(D) Time stamp of the fault message (date and time of the incoming message)
(E) Sender address (optional / physical address of the bus subscriber from where the fault message was sent)
(F) State of the fault message (for distinguishing between an active or inactive fault message)
(G) Message texts in 2 lines (configurable / max 20 characters)
(H) Additional ASCII text (optional / is received by 14-byte object)
(I) Control surface for acknowledging a fault message by the user (optional / is only visible for messages that are not acknowledged)

ⓘ The message window can optionally be opened automatically as well when a new fault message is received on the device. This behaviour is set by the parameter "Open message window", which is available in the configuration software specifically for each fault message.

A list of all acknowledged and active fault messages is displayed in the left-hand section of the message window. Furthermore, the fault messages that have not been acknowledged are also shown in the list. The fault message last activated is always at the top of the list.
Each fault message has a control surface (B). When a control surface is pressed, information about the selected fault message appears in the right-hand section of the message window. The name of the fault message is displayed in the first line (C). This text can be configured in the configuration software (max. 20 characters) and is also accepted in the message list, if an entry is to be made. The name is followed by the time stamp of the fault message (D). This time stamp identifies the time (date and time) when the message was recorded as "coming". The physical address of the sender of the fault message can optionally follow the time stamp (E). The parameter "record sender address" specifies whether or not the sender address is displayed in the message window.

The message window displays the status of the selected fault message in plain text (F). In this way, it is possible to identify whether or not the fault message is still active. Below this is a display text which can be freely configured in the configuration software (max. of 20 characters each). An external text received from the device via a separate 14-byte object can be displayed if required.

The message window can be closed by pressing the symbol" 〈 back" in the status line at the top edge of the screen.

4.2.4.6.2 Acknowledgment and message list

Acknowledgement of a fault message

A fault message can either be confirmed internally via the control surface "Acknowledge" in the message window (internal acknowledgement) or via the bus by means of a separate 1-bit communication object (external acknowledgement).

With internal acknowledgement, the parameter "Transmit value on acknowledgement" in the parameters of a fault enables the following acknowledgement properties of the operating element "Acknowledgement" to be defined in the message window...

- Parameter not set: When the operating element is pressed, the acknowledgement is only processed internally. No information is sent to other devices.
- Parameter set: An additional "acknowledgement object" is made visible. When the operating element is pressed, the acknowledgement is also sent to other devices via this 1-bit object. The telegram polarity of the acknowledgement object can be configured.

An additional 1-bit communication object can be enabled for implementing external acknowledgement. If the parameter "Allow external acknowledgement" is set, a fault message can also be acknowledged by other KNX devices. In this case, the "Acknowledgement receipt object" is displayed.

ℹ When a fault message is acknowledged, an acknowledgement event is logged in the message list (see next section).

Message list

If necessary, it is possible to set separately in the parameters whether each fault message should be saved in the message list of the device. The message list is a separate display page that can be accessed via the function view (tile with the symbol ⚠) or by an internal open page.

The following events of a fault can be logged in the message list...

- Time of the fault message, logged as "coming",
- Time the fault message is retracted (fault cause eliminated), logged as "going".
- Time of acknowledgement, logged as "acknowledged".

In the "Message list" parameter group of a fault message it is possible to configure which of the three named events is logged in the message list. In addition, the "Fault text" and the time stamp are logged and displayed in the message list, thus allowing clear identification.

ℹ The message list is deleted after a commissioning operation of the device. If the power supply fails, the events stored in the message list are not lost.

4.2.4.7 Scene function

4.2.4.7.1 Definition and function

The device can manage up to 24 internal scenes in which up to 32 different scene functions (actuator groups) can be activated that affect the KNX. The internal scenes can be controlled by the operation functions (see page 104-105) as well as by a separate extension object. Control by means of the extension object - such as a pushbutton with a scene extension function - is only possible if a group address in the parameter branch of the scenes for the global scene settings is linked with the object.
The extension object according to KNX DPT 18.001 can be used both to open and save the scenes. The scene received via the object specifies which internal scene should be recalled or saved. The configuration software automatically assigns numbers from 1 to 24 to the scenes created. No other scene numbers are supported.
The saving of scene values using the extension object is only available if the save function has been enabled in the configuration software in the parameter branch of the scenes for the global settings.

During the definition in the configuration software, scenes (1...24) are assigned to one or more scene function(s) (1...32). The scene commands are transmitted via the communication objects of the scene functions. KNX actuators receive these commands and activate lighting and shading systems depending on the situation. When recalling a scene, the device transmits a telegram with the defined scene command via the communication objects of the assigned scene functions.
Scene functions can be configured alternatively to the data formats "DPT 1.001 (1-bit switching)", "DPT 5.001...5.004 (1-byte value)" or "DPT 9.001...9.021 (2-byte value)". The display formats for representing the scene commands (switching or value) on the scene page (see page 167) can also be configured depending on the set data type.

If scene commands are to be changed during operation of the device, the memory function of the device can be used. For this purpose, the actuators must first be controlled by local operating functions or by other bus subscribers via the KNX (e. g. push-button sensors) in such a way that the desired scene states (brightness values or blind/shutter heights) are set. After that, the memory function of a scene can be executed. For this purpose, the device transmits a read request to the activated actuator communication object and awaits the responses ("Read"-flags must be set for the actuator objects!). If the activated KNX actuators return a state, the scene function saves the returned switching state or value in the non-volatile memory and thus replaces the old scene command of the corresponding scene function. If actuators do not return individual states to the device, the original scene commands remain unchanged in the device.

ℹ The recalling of scenes can quickly cause a higher bus load especially if many functions were assigned to a scene. To avoid an excessive bus load, a time delay can be configured between scene telegrams (50...500 ms) in the parameter branch of the scenes for the global scene settings.
The transmission of telegrams in the course of the storage function always takes place immediately.

The project design of the scene function in the configuration software consists primarily of two steps...

- creating and defining all necessary scenes functions (1...32) incl. presetting of the scene commands (see page 165).
- creating and defining all necessary scenes (1...24) incl. assignment to the scene functions (see page 165-166).

After commissioning the device, the preset scene names and scene commands can be changed directly on the panel. The scene page is available in the function view for this purpose. The scene page is opened by pressing the tile with the icon " ⚙" (see page 167).

i When scene names or commands are changed directly on the device by the user, the following should be observed:
User settings are saved in the non-volatile memory. Any changes made to scene names or scene commands by the user directly on the device are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if scene settings in the configuration software were not significantly changed.
If, however, elementary scene settings were changed in the configuration software, user settings for scenes will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of scene functions
- Addition or removal of scene functions for individual scenes
- Restrictions of value limits (Minimum, Maximum)

4.2.4.7.2 Creating and defining scene functions and scenes

Creating and defining scene functions

The scene commands are transmitted to the bus via the scene functions. KNX actuators receive these commands and activate lighting or shading systems depending on the situation. Up to 32 different scene functions can be created in the configuration software. Before the actual scenes can be defined, the required number of scene functions (equivalent to actuator group) must be created and configured.

The configuration of the scenes can be accessed via the project bar in the configuration software by clicking on the entry "Scene function". Afterwards, scene functions can be added in the structure view. After adding the scene functions, they should immediately be given clear names for additional clarity and identification (e.g. "ceiling luminaires", "wall luminaires"). The names can be edited by double-clicking.

i Scene functions can be deleted in the structure view and thus removed from the scene function. It should be noted here that assignments to scenes and user settings (after commissioning) will be lost!

One "function object" is available for each scene function in the configuration software. A group address must be linked to each of these objects, which must also be linked to actuators on the KNX side. The data format of a scene function, and thus of the corresponding function object, can alternatively be configured to the data formats "DPT 1.001 (1-bit switching)", "DPT 5.001...5.004 (1-byte value)" or "DPT 9.001...9.021 (2-byte value)". Depending upon this, additional parameters for a scene function become visible in the configuration software, which define the display format for value commands (unit, offset, factor, number of digits before and after the decimal point), the settable value range (minimum and maximum) or display formats (image texts and symbols) for switching commands.

i The transmission of scene commands via the function objects can quickly cause a higher bus load especially if many functions were assigned to a scene. To avoid an excessive bus load, a time delay can be configured between scene telegrams (50...500 ms) in the parameter branch of the light scenes for the global light scene settings.
The transmission of telegrams in the course of the storage function always takes place immediately.

Creating and defining scenes

After creating and defining all necessary scene functions in the configuration software, the actual scenes can be created and configured. During the course of the configuration, any number of the existing scene functions (1...32) are assigned to the individual scenes for which individual scene commands can then be configured ("ON", "OFF", brightness values etc.). This makes the activation of KNX actuator groups then possible.

The configuration of the scenes can be accessed via the project bar in the configuration software by clicking on the entry "Scenes". Afterwards, up to 24 scenes can be added in the structure view. After adding the scenes, they should immediately be given clear names for additional clarity and identification (e.g. "Scene TV", "Scene dining", "Scene guest"). The names can be edited by double-clicking.
The user can change scene names on the device later after commissioning if this was enabled.

i On adding, the light scenes receive their light scene number automatically, with which they can be opened later using the extension object.

i Scenes can be deleted in the structure view and thus removed from the scene function. It should be noted here that the user settings will be lost after commissioning!

It is possible to assign scene functions to a scene in the work area of the configuration software. To do this, a scene must first be selected in the structure view by mouse click. After that, all scene functions or just a individual scene functions can be selected and assigned to the scene.

Scene functions that have already been assigned appear in list form in the work area. Functions assignments can subsequently be changed by clicking on the name of the scene functions.

ⓘ Assignments of scene functions to scenes can be deleted in the work area. It should be noted here that the user settings will be lost after commissioning!

The actual scene commands must be defined during the further course of the scene function configuration. This is also done in the work area of the configuration software. The commands which can be edited here align themselves to the set data and display format of the individual scene functions.
Lastly, you can define whether the function in a scene recall or scene storage function is active or not for each scene function contained in a scene. Telegrams are transmitted via the function objects when recalling a scene or saving only for scene functions that are set to "active" in the corresponding scene. Inactive scene functions behave passively (no telegram transmission).

ⓘ The characteristics of scenes, whether the scene functions contained are active or passive, can be changed on the device later at any time after commissioning. This means that the user can hide individual actuator groups from scenes or add them to scenes as required.

Scenes are created and predefined as described in the configuration software. After commissioning the device, the user can change the preset scene names and scene commands. The scene page is available in the function view for this purpose (figure 10).
In the configuration software you can define whether or not it should be possible to change scenes on the device. For this purpose, the parameter "Allow adaptation of the scene by the user" is available per scene. If this parameter is not set, the scene concerned cannot be edited via the scene page.

4.2.4.7.3 Configuration of scenes directly on the device

After commissioning, scene commands can be edited directly on the device - by the installation engineer or by the user. In addition the light scene names can be modified. This requires that editing and modification of the scene characteristics is permitted. A parameter is available per scene in the configuration software for this purpose (see page 165-166).
Editing of scene commands and scene names - if allowed - is possible on the configuration page of the scenes.

The configuration page of the scenes is recalled via the function view in the main menu level (predefined display structure) (figure 80). To do this, press the tile with the ⚙ symbol (1.).

As soon as the scene page is opened, a list of all scenes created in the device will be displayed. Up to 4 scenes are displayed simultaneously. If more than 4 scenes have been created, the list can be switched by the sensor surfaces ﹀ / ︿.

Scenes can be edited and adapted via the scene page if this was enabled in the configuration software. If scenes cannot be adapted, they will appear in a grey, non-operational tile (B). Adaptable scenes have operational display elements (A).

ℹ If the display element of an adaptable scene is pressed for a long time (min. 1 second), the device recalls the editing mode of the scene name. This allows the user to change the predefined scene names in the configuration software at any time.
In the editing mode, an on-screen keyboard is displayed. After entering the desired name using the keyboard, the new name is saved in the device memory by pressing the green highlighted "Save ✓" surface in the status line at the top right. By pressing the red highlighted " ❬ Cancel" surface the system returns to the screen page without saving the name that was entered. In this case, the original scene name remains unchanged.

To return to the main menu level if you are on the configuration page of the scenes, press the icon "❬ Functions" (2.) in the status line at the top edge of the screen.

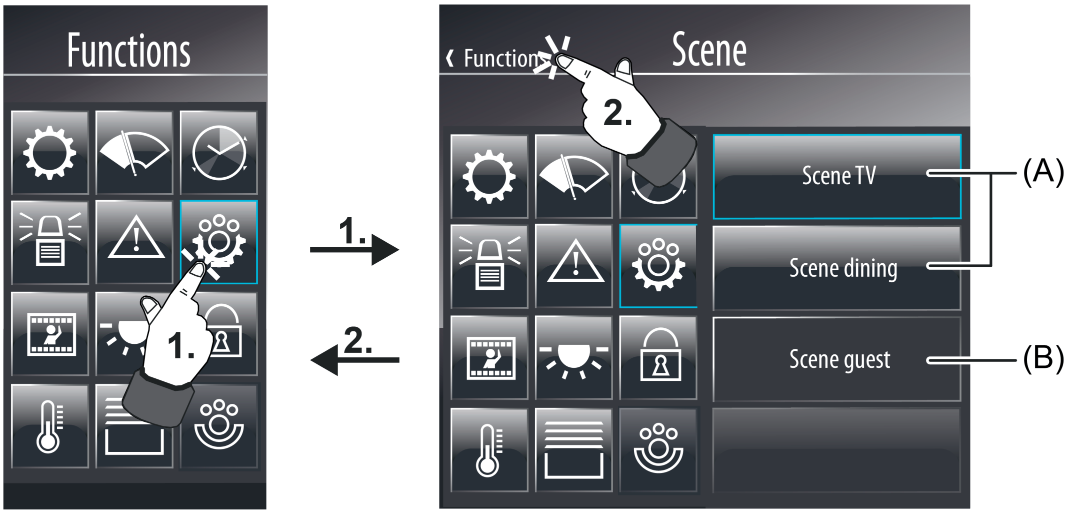


Figure 80: Example of a scene page in the function view (right)

(A) Adaptable scenes (operational)
(B) Non-adaptable scenes (not operational)

If you touch the sensor surface of an adaptable scene with your finger (3), the device branches to the submenu of the scene submenu (figure 81). Two control surfaces are displayed there for recalling the scene (C) and for executing the save function (D). Furthermore, all of the scene functions assigned to the scene are displayed in list form (E+F). If more than 2 functions are allocated, the list can be switched by the sensor surfaces ﹀ / ︿. Active scene functions are indicated by the " ✓" symbol (E). Inactive scene functions are indicated by the "**X**" symbol (F).

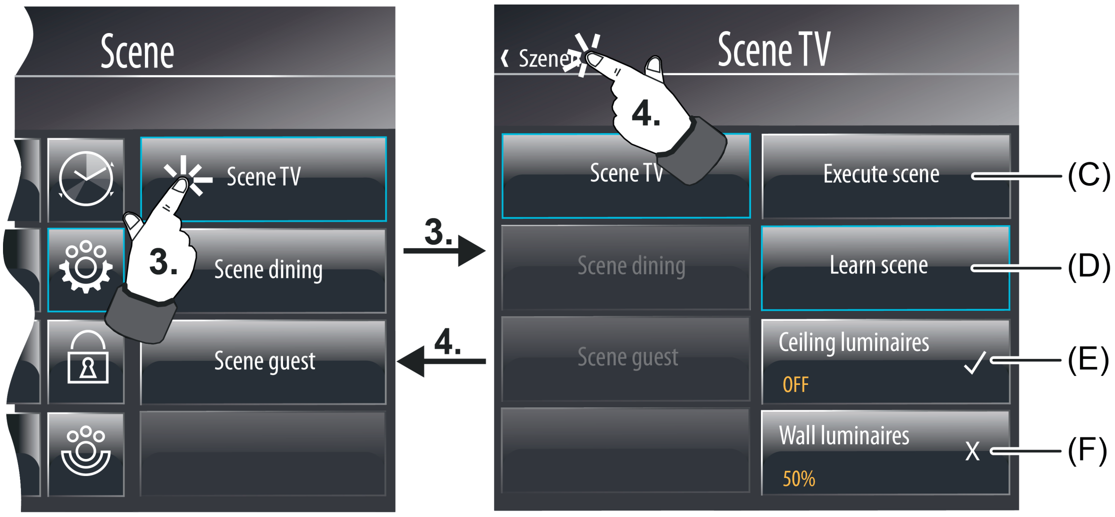


Figure 81: Example of a scene with scene submenu (right)

(C) Control surface for recalling the scene
(D) Control surface for executing the save function
(E) Active scene function
(F) Inactive scene function

To return to the scene page, press the icon " ‹ " (supplemented by the name of the scene page) (4) in the scene submenu in the status line at the top edge of the screen.

Scene recall or scene storage function in the scene submenu

After pressing the control surface (C), the device immediately recalls the corresponding scene. Such an operation is comparable with recalling an internal scene via the KNX operating function "Scene recall" (see page 104-105).
If the control surface (D) is pressed long (min. 1 second), the device executes the memory function of the selected scene. At the same time, all assigned scene functions poll the current switching states or values as quickly as possible via their function objects in the actuator groups (ValueRead). After that, the actuators have to return the current state or value per scene function (ValueResponse). To make this possible, the "Read" flag on one actuator each of the different actuator groups must be set to the activated communication object!
The light scene function waits for a feedback of the different switching states or values in a defined time window. This waiting time depends on the number of assigned scene functions (max. 7 seconds). After the waiting time has elapsed, the device saves all returned states or values in the non-volatile memory and thus replaces the old scene commands by the new presettings. If actuator groups have not given any feedback to the device, the old switching or value commands remain unchanged for the scene functions concerned.

Adapting scenes in the scene submenu

If you touch the sensor surface of an active or inactive scene function with your finger (5.), the device branches to the configuration menu of the respective function. The representation of the configuration menu depends on the set data type of the scene function.
With the data type "1-bit switching" (figure 82) a display area with status text and icon (H) is visible and an operating area for presetting the scene switching command (I) by a rocker switch.
With the data types "1-bit value" and "2-bit value" (figure 83) the display area is only characterised with a status value (H). If this display area is pressed long (approx. 1 second), the device displays an on-screen keyboard. A new scene value can be preset directly by means of this keyboard. Alternatively, new scene values can be preset by the value slider in the operating area (I).

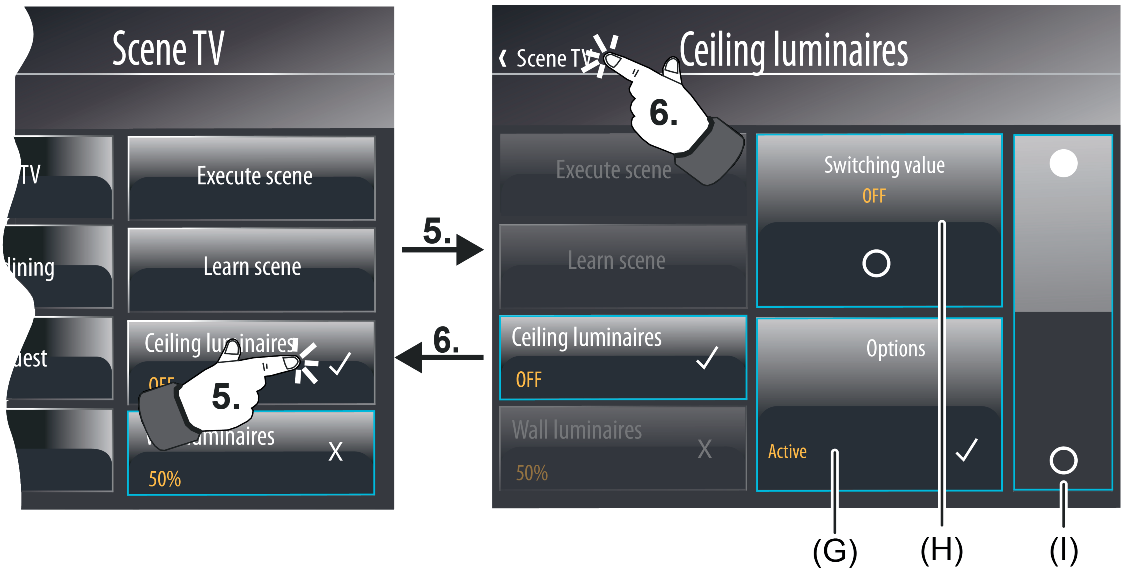

Scene TV
TV
Execute scene
ining
Learn scene
est
Ceiling luminaires
OFF
5.
Wall luminaires
50%
X
5.
6.
Scene TV
Ceiling luminaires
6.
Execute scene
Switching value
OFF
Learn scene
Ceiling luminaires
OFF
Options
Wall luminaires
50%
Active
(G)
(H)
(I)

Figure 82: Example of a scene configuration page (right) - scene function "Switching"

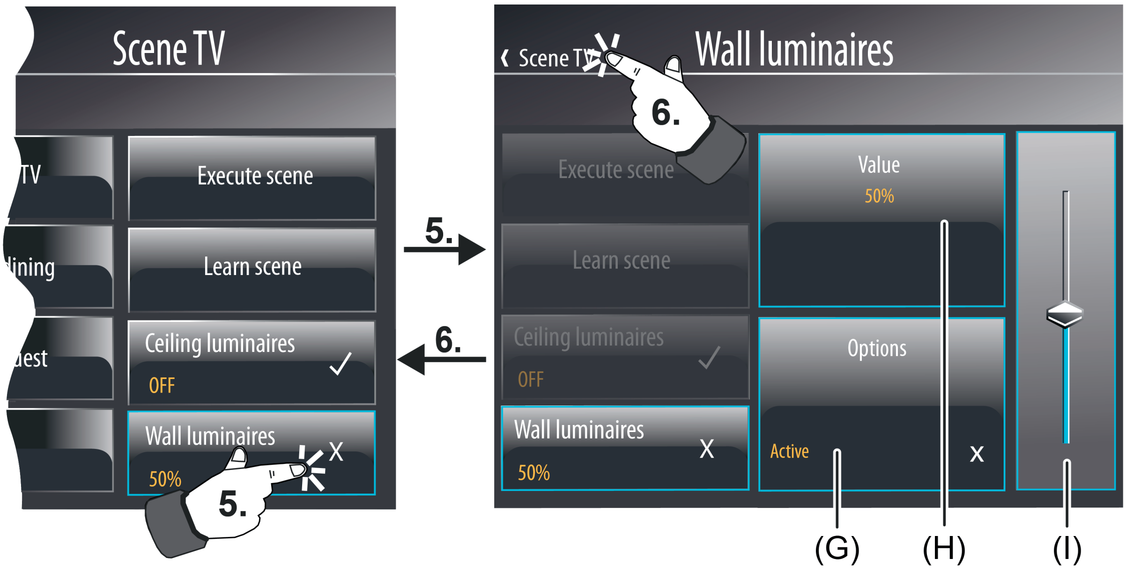

Scene TV
TV
Execute scene
ining
Learn scene
est
Ceiling luminaires
OFF
Wall luminaires
50%
X
5.
5.
6.
Scene TV
Wall luminaires
6.
Execute scene
Value
50%
Learn scene
Ceiling luminaires
OFF
Options
Wall luminaires
50%
X
Active
x
(G)
(H)
(I)

Figure 83: Example of a scene configuration page (right) - scene function "Value"

(G) Control and display surface for active or inactive switching of the scene function

(H) With data format "1-bit switching": Display surface for the status indication of the scene command by text and symbol.
With data formats "1-bit switching" or "2-byte value": Control and display surface for status indication of the scene command and for displaying the keyboard for the purpose of value presetting.

(I) Operating area for presetting a scene command
With data format "1-bit switching": Rocker control surface (up ON, down OFF)
With data formats "1-bit value" or "2-byte value": Value slider

When changing the scene command using the rocker control surface, the change must be acknowledged via the value slider or keyboard (only for values) and saved in the device memory. Once a switching or value command has been executed, the control surfaces "❬

Cancel" (highlighted in red) and "Save ✓" (highlighted in green) are visible in the status line. By pressing the "Save" surface, a new scene command is saved in the device memory and the system returns to the scene submenu. By pressing the "Cancel" surface, the old scene command remains unchanged.

ⓘ The light scene commands set on the device are saved in the non-volatile memory and are thus not lost if the power supply fails. When changing scene commands directly on the device, the following should be observed:
Any changes made to scene names or scene commands are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if scene settings in the configuration software were not significantly changed.
If, however, elementary scene settings were changed in the configuration software, user settings for scenes will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of scene functions
- Addition or removal of scene functions for individual scenes
- Restrictions of value limits (Minimum, Maximum)

You can define whether the function in a scene recall or scene storage function is active or not for each scene function contained in a scene. Telegrams are transmitted via the function objects when recalling a scene or saving only for scene functions that are set to "active" in the corresponding scene. Inactive scene functions behave passively (no telegram transmission). The state of a scene function in the selected scene can be influenced by pressing the control surface (G). As a result, the user can hide individual actuator groups from scenes or add them to scenes as required. Each time the control surface is pressed, the state switches over between "Active" (marker " ✓") and "Inactive" (marker "**X**"). Any change of the state must also be acknowledged here in the status line and saved in the device memory via the control surface "Save ✓". The last setting is discarded by pressing the control surface "〈 Cancel".

To return to the corresponding scene submenu when in the configuration menu, press the icon "〈" in the status line at the top edge of the screen (supplemented by the scene name) (6.).

4.2.4.8 Timer switch function

4.2.4.8.1 Definition and function

The device has an integrated multichannel weekly timer. The timer supports up to 64 switching channels with a total of 128 switching times that can be distributed individually to the channels. The switching times directly affect the communication objects of the individual channels, and if necessary, can handle the data formats "switching 1-bit" (DPT 1.xxx), "Operating mode switchover 4 x 1-bit", "Operating mode switchover KNX", "Scene" (for recalling an internal scene), "Value 1-byte" (DPT 5.001, 5.010. 6.010), "Value 2-byte" (DPT 9.001...9.021, 8.001, 7.001) and "Value 4-byte" (DPT 14,000...14.079, 13.001, 12.001).
Additionally, it is possible to also activate a random function (see page 174) and an astro function (see page 173-174) for brightness-dependent lighting or shading control in the morning or evening twilight for each switching time.

Switching times can be configured down to the minute. Weekdays can be freely specified for each switching time. The set weekdays specify on which days of a calendar week the timer commands are to be executed. A switching time thus consists of the time of day and weekday information.
At each minute mark - possibly offset by a few seconds - the timer checks the set switching times. If a switching time corresponds to the current time (check for hours and minutes) and current weekday, the preset switching time command is executed. Different switching time commands (e.g. switching a lighting system on and off) require various switching times.
If several switching times with an identical configuration (the same time and weekday) are allocated to a timer switching channel, the switching time command of the last switching time will always be executed.

The timer is controlled by the device's internal system clock (time and date of the operating system). Consequently, a valid time and current date must be preset for the correct execution of the switching times. The system clock can be set directly in the operating system (also per IP via SNTP) via the communication objects "Time" (KNX DPT 10.001) and "Date" (KNX DPT 11.001) or via the user and system settings directly on the device.

ℹ The real time clock has a calendar function. Depending on the date set, the day is determined automatically by means of the internal calendar which is necessary for processing the timer. The day transmitted in the KNX time telegram in compliance with DPT 10.001 is irrelevant and is discarded by the device.

ℹ The device's internal system clock is designed as a real time clock (RTC) and has an accuracy of approx. +/- 2 seconds per day. It is advisable to set the system clocks of all devices once a day, for example, by a shared KNX time telegram during the night hours, so that that the timing of all devices is synchronized even over a long period of time.
The system clock has its own energy storage. This will ensure that the clock keeps on running interruption-free for at least 24 hours if the mains power supply fails.

When the internal clock is resynchronised, a distinction is to be made between two cases...

- The clock is moved back to a time before an already executed switching time. In this case, the programmed command is not executed again when the switching time occurs. The device waits for the next switching time if there are more.
- The clock is moved forward to a time after an as yet unexecuted switching time. In this case, the last programmed command of the channel is carried out.

ⓘ The timer remains active even when the device is switched off (operating system has been shut down) or is in the idle state. The KNX function part (BCU) is functional as long as mains voltage and bus voltage are switched on.
In the event of a bus voltage failure, the timer cannot transmit any telegrams. After bus voltage return, the timer checks whether switching times would have had to be carried out recently. If this is the case, the last programmed command is carried out for the affected channels.

The KNX function part executes the timer commands independently. To ensure that it can also do this, the KNX function section needs regular information regarding the switching times that were last programmed by the installation engineer or user when the operating system and thus the KNX application are in idle mode. The KNX function part can temporarily store and execute the switching times every 24 hours. If the temporarily stored switching times have been executed, the KNX function part must be resynchronised with switching times.
The synchronisation takes place cyclically depending on the time of day, or when the KNX module has executed all switching times in one day. In the configuration software for the global timer parameters, you can define at what time of day the recurrent synchronisation should take place. The parameter "Time for synchronisation of the switching times" defines the time for the synchronisation process regardless of whether or not the KNX module still has switching times. In addition, the KNX module requests switching times automatically if it has executed all switching times in one day.
The synchronisation process takes a short time. In addition, the device is reactivated from the idle state, should this be necessary. To ensure that the reactivation and synchronisation of the device does not disturb the user, a time of day that is outside of the normal times of use should be specified in the parameter for cyclical synchronisation.

ⓘ The device cannot be reactivated automatically for the synchronisation if it was switched off by the user (operating system shut down). In this case, the synchronisation of the KNX function part remains off. The KNX function part will then continue to work with the old switching times until a new synchronisation is carried out.

The project design of the timer switch function in the configuration software consists primarily of two steps...

- Creation and definition of all necessary timer switch channels (1...64) (see page 175-176).
- Configuration of all necessary switching times (1...128) in the individual timer switch channels (see page 176-177).

After commissioning the device, the preset switching times can be changed directly on the panel. The timer switch page is provided in the function view for this purpose. The timer switch page is opened by pressing the tile with the icon " 🕓" (see page 178).

4.2.4.8.2 Astro and random function

Astro function

The astro function allows the control of a lighting or shading system depending on sunrise and sunset and a limit time. The astro function can be activated separately for each switching time. The device calculates the time of the sunrise and sunset (astro time) automatically according to the local geographic position (geographic co-ordinates). The setting of the co-ordinates is the precondition for correct functioning and is carried out in the parameter node of the global timer parameters and applies in the same way to all the timer switch channels.

When the astro function is activated, the time set in the configuration software or directly on the device is used as the limit time. Whether the limit time affects sunrise or sunset is evaluated by the device according to the set time. Times between 00:00 and 11:59 are evaluated as sunrise and times between 12:00 and 23:59 as sunset.
An astro function usually affects lighting (e.g. exterior lighting) or shading (e.g. roller shutters). The behaviour of the device when processing the astro switching times varies according to these applications. The parameter "Astro: Channel affects" in the parameters of a timer switch channel defines the astro behaviour - regardless of the data format of the communication objects of the channel - as follows...

- "Lighting" setting:
  Sunrise (switching times 00:00 - 11:59): if sunrise occurs before the set time (for example in the summer months), then, at sunrise, the switching time command (e.g. external lighting OFF) is sent to the bus. If sunrise occurs later (for example during the winter months), then the switching time command is sent to the bus at the set time at the latest. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".
  Sunset (switching times 12:00 - 23:59): if sunset occurs after the set time (for example in the summer months), then the switching time command (e.g. external lighting ON) is sent to the bus at sunset. If sunset occurs earlier (for example during the winter months), then the switching time command is sent to the bus at the set time at the latest. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".

- "Shading" setting:
  Sunrise (switching times 00:00 - 11:59): if sunrise occurs after the set time (for example in the winter months), then the switching time command (e.g. roller shutters UP) is only sent to the bus at sunrise. If sunrise occurs earlier (for example during the summer months), then the switching time command is sent to the bus at the set time at the latest. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".
  Sunset (switching times 12:00 - 23:59): if sunset occurs before the set time (for example in the winter months), then the switching time command (e.g. roller shutter DOWN) is sent directly to the bus at sunset. If sunset occurs later (for example during the summer months), then the switching time command is sent to the bus at the set time at the latest. When a switching time is set in the configuration software, the appropriate time is indicated with "At the latest...".

Optionally, the astro time for the morning and evening determined by the device can be statically shifted in the minute range (-120...0...+120). Thus, the switching times influenced by astro can be individually adapted to local conditions (e.g. influence by high mountains or forests). In the configuration software the astro shift is defined for a timer switch channel by a parameter "Astro: Offset morning " and "Astro: Offset evening".

ⓘ Depending on the geographic position of the location, the astro times for sunrise and sunset will vary by several hours. If a switching time with an active astro function affects another switching time of the timer switch channel, then the astro function is not executed. Example: a switching time is set to 17:00, astro function active (seasonal sunset between 16:00 and 22:00), an additional switching time is set to 19:00 -> In this case, the second time (19:00) would be affected by the astro function, meaning that it would be deactivated for the affected switching time(s). The same would apply, if both switching times in the example had the astro function active.

Random function

The switching times of a channel can be triggered offset in a set random period. The random function can be activated separately for each timer switch channel and affects all the switching times of the appropriate channel.
Each day at 00:00, the device calculates a time offset individually and randomly for each switching time, by which a switching time is brought forward minute-by-minute (-) or is set back (+). The maximum time offset between the set switching time and the actual time of the version can be configured in the configuration software for each timer switch channel using the parameter "Random: max time offset". This allows time offsets of between 1 and 30 minutes. The setting "0" for the time offset completely deactivates the random function for the timer switch channel. The device randomly determines a time from the configured maximum time offset and adds this time either to the set switching time or, alternatively, subtracts it from the switching time.

ⓘ It is not possible to transfer the switching times into the previous or next day using the time offset, i.e. the random function does not extended beyond the ends of days. If a randomly calculated time offset of a switching time go beyond the end of a day, then the random function for the affected switching time is not executed. The same applies when the random time offset affects other switching times in the timer switch channel. When using the random function to specify the switching times of a channel, care should be taken to ensure that the individual switching times are apart by at least +/- the maximum time offset, as configured in the configuration software.
Example: maximum time offset = +/- 30 minutes, one switching time set to 11:00, random function active -> other switching times of the channel may be between 00:00 ... 10:30 and 11:30 ... 23:59 The same applies to additional switching times with a random function.

ⓘ If, in addition to the random function, an astro function is also activated, then the following prioritisation applies to the calculation of the switching time:
1. Astro time complying with "Not before..." / "At the latest..."
2. The random time is added or subtracted to the time calculated under 1.

4.2.4.8.3 Creating and defining timer switch channels and switching times

Creating and defining timer switch channels

The commands of the switching times are transmitted to the bus via the communication objects of the timer switch channels. KNX actuators receive these commands and activate, for example, lighting or shading systems time-controlled. Up to 64 different timer switch channels can be created in the configuration software. The switching times are configured during the definition of the individual timer switch channels.

The configuration of the timer switch channels can be accessed via the project bar in the configuration software by clicking on the entry "Timer". Afterwards, timer switch channels can be added in the structure view. After adding the timer switch channels, they should immediately be given clear names for additional clarity and identification (e.g. "external lighting", "move venetian blinds"). The names can be edited by double-clicking.

ℹ Timer switch channels can be deleted in the structure view and thus removed from the timer. It should be noted here that the user settings on switching times (after commissioning) will be lost!

One communication object is available for each timer switch channel in the configuration software. A group address must be linked to each of these objects, which must also be linked to actuators on the KNX side. The data format of a timer switch channel and thus the corresponding object can be configured alternatively to "Switching", "Operating mode switchover" (4 x 1-bit or KNX)", "Scene" or to value formats (1-byte, 2-byte, 4-byte with different formats and value ranges). Depending upon this, additional parameters for a timer switch channel become visible in the configuration software, which define the display format for value commands (unit, offset, factor, number of digits before and after the decimal point), the adjustable value range (minimum and maximum) or display formats (image texts and symbols).

Data type	Status elements	Value range
Switching	Symbol and image text	"0" (OFF) / "1" (ON)
Operating mode switchover 4 x 1 bit	Symbols and image texts	Comfort, Standby, Night operation, Night reduction, Frost/heat protection
Operating mode switchover KNX	Symbols and image texts	Automatic, Comfort, Standby, Night operation, Night reduction, Frost/heat protection
Scene	static icon and scene name	internal scenes
1-byte value (5.00x)	Status value (formatted)	%: 0...100 °: 0...360 user-defined: 0...255
1-byte value (5.010)	Status value (formatted)	0...255
1-byte value (6.010)	Status value (formatted)	-128...127
2-byte value (7.001)	Status value (formatted)	0...65535
2-byte value (8.001)	Status value (formatted)	-32768...32767
2-byte value (9.0xx)	Status value (formatted)	-671089...670761
4-byte value (12.001)	Status value (formatted)	0...4294967295

4-byte value (13.001)	Status value (formatted)	-2147483648...2147483647
4-byte value (14.0xx)	Status value (formatted)	-214748365...214748365

Configurable data types and status elements for timer switch channels

ⓘ The value ranges of the value data types can be limited by parameters in the configuration software.

ⓘ With the data type "Scene", internal scenes are recalled via the switching times. For this purpose, at least one internal scene must have been created in the device!

A disabling object is optionally available for every timer switch channel. Timer switch channels can be locked via the disabling objects during the running time of the device. In these cases, the objects of the timer switch channels do not transmit when a switching time occurs. The telegram polarity of the individual disabling objects (which telegram is disabled or enabled) can be configured on the parameter page of a timer switch channel.
If the parameter "Transmit after disabling is enabled" is set, the device evaluates the configured switching times upon re-enabling. If one or more switching times were not executed during the previously active disable phase, the device carries out the execution of the last switching time and transmits a corresponding telegram to the bus via the communication object of the timer switch channel. If the parameter "Transmit after disabling is enabled" is not set, the switching times will be ignored upon re-enabling. In this case, switching times skipped by the disabling function are not carried out.

Defining switching times

After creating and defining all necessary timer switch channels in the configuration software, the actual switching times can be created and defined. Switching times are created and defined for a timer switch channel in its parameter structure in the work area of the configuration software. It is possible to add switching times - if a timer switch channel was selected - in the work area of the configuration software. Up to 128 switching times can be created in the entire device, which are distributed to the individual timer switch channels. At least one switching time should be created for each timer switch channel.

A switching time has the following parameters...

- Parameter field "Value": This parameter defines the value of the switching time. The adjustable value depends on the configured data format of the corresponding timer switch channel.
- Parameter fields of the weekdays: The weekdays on which the switching time event is to take place are defined here.
- Parameter field "Switching time": The actual switching time is defined here. The setting is made in the 24-hour format.
- Parameter field "Astro": The presetting whether the astro function is activated for the switching time is made here. The astro function can be activated individually for each switching time. The function of the astro function and its optional time offset are defined in the parameters of the corresponding timer switch channel.
- Parameter field "Random": This parameter is used to preset whether the random function is activated for the switching time. The random function can be activated individually for each switching time. The maximum time offset for the random function is defined in the parameters of the corresponding timer switch channel.

ℹ When switching times are changed directly on the device by the user, the following should be observed:
User settings are saved in the non-volatile memory. Any changes made by the user directly on the device are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if settings for timer switch channels or switching times in the configuration software were not significantly changed.
If, however, elementary settings were changed in the configuration software, user settings for timer switch channels will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of timer switch channels
- Addition or removal of switching times for timer switch channels
- Restrictions of value limits (Minimum, Maximum)

4.2.4.8.4 Direct configuration of switching times

After commissioning, - by the installation engineer or by the user - switching times of the timer can be edited or created directly on the device. The switching times can be edited and created with the aid of the configuration page of the timer, which can be recalled via the function view in the main menu level (predefined display structure) (figure 84). To do this, press the tile with the ⏲ symbol (1.).

As soon as the timer switch page is opened, a list of all timer switch channels created in the device is displayed. Up to 4 channels are displayed simultaneously. If more than 4 channels have been created, the list can be switched by the sensor surfaces ⌄ / ⌃.

To return to the main menu level if you are on the configuration page of the timer, press the icon "‹ Functions" (2.) in the status line at the top edge of the screen.

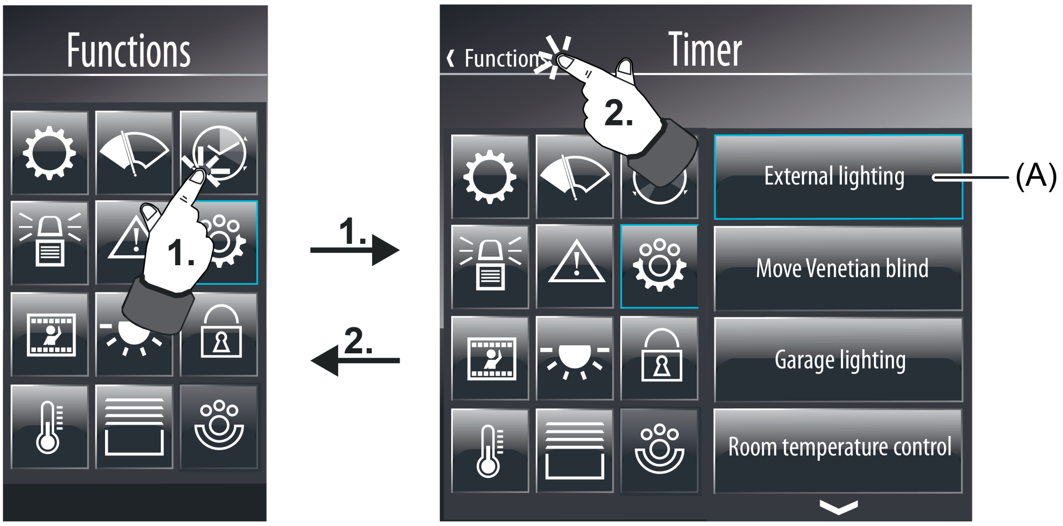


Figure 84: Example of a timer switch page in the function view (right)

(A) Control surface for timer switching channel

If you touch the control surface of a timer switch channel with your finger (3), the device will branch to the submenu of the switching times (figure 85). All switching times assigned to the timer switch channel appear in the display. If more than 3 switching times are allocated, the list can be switched by the sensor surfaces ⌄ / ⌃. Active switching times are indicated by the " ✓ " symbol (E). Inactive switching times are indicated by the "**X**" symbol (C).
An additional switching time can be added to the timer switch channel by pressing the control surface "New switching time" (D).

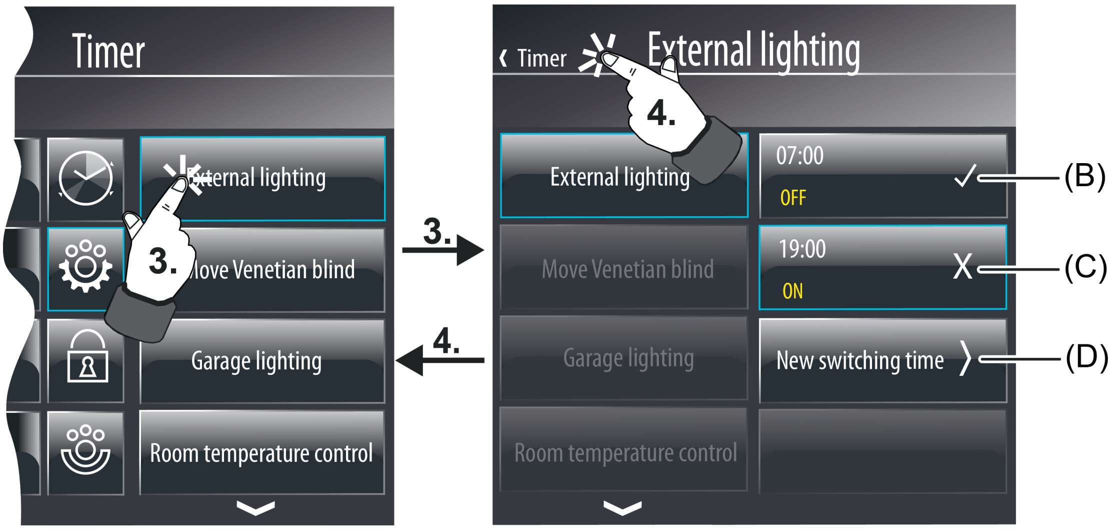


Figure 85: Example of a submenu for a timer switch channel with 2 switching times (right)

(B) Control surface of an active switching time
(C) Control surface of an inactive switching time
(D) Control surface for adding a new switching time

To return to the timer page, press the icon " ‹ " (supplemented by the name of the timer page) (4) in the submenu in the status line at the top edge of the screen.

If you touch the sensor surface of an active or inactive switching time with your finger (5.), the device will branch to the configuration menu of the respective switching time. The same occurs when a new switching time is to be added. The representation of the configuration menu depends on the set data type of the timer switching channel.

With the data type "Switching (figure 86), for example, a display area with status text and icon (F) is visible and an operating area (G) for presetting the switching command by a rocker switch. With the data types "Scene" or "Operating mode switchover" status and operating elements are displayed in the same way.

With the data types "value" (figure 87), however, the display area is only characterised with a status value (F). If this display area is pressed long (approx. 1 second), the device displays an on-screen keyboard. A new switching value can be preset directly using this keyboard. Alternatively, new switching values can be preset by the value slider in the operating area (G).

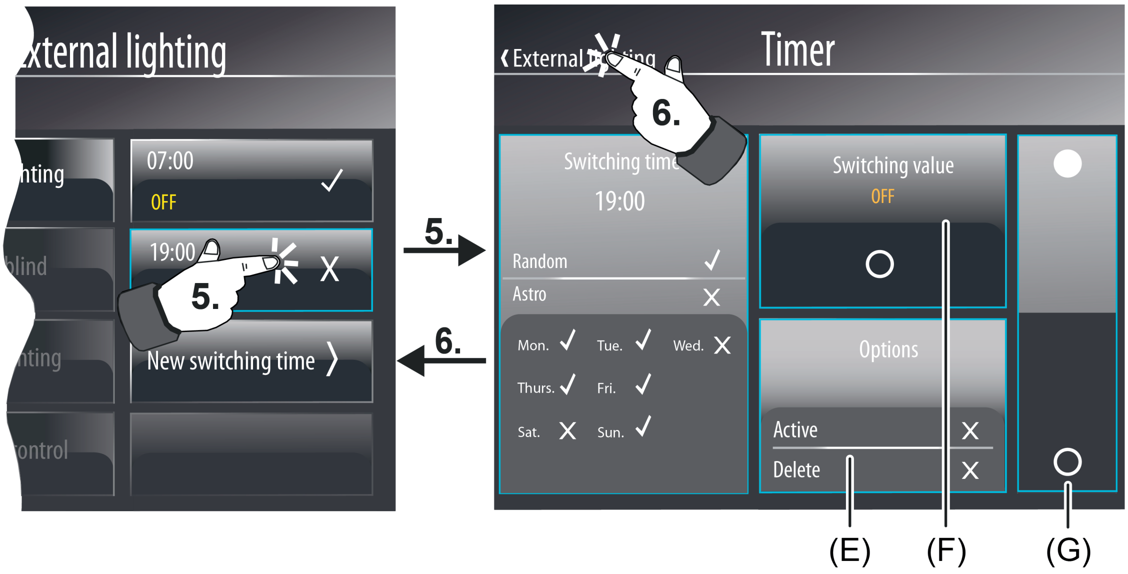

xternal lighting
hting
blind
hting
ontrol
07:00
OFF
19:00
5.
New switching time
5.
6.
External lighting
6.
Timer
Switching time
19:00
Random
Astro
Mon.
Tue.
Wed.
Thurs.
Fri.
Sat.
Sun.
Switching value
OFF
Options
Active
Delete
(E)
(F)
(G)

Figure 86: Example of a configuration page for switching times (right) - Data type timer switch channel "Switching"

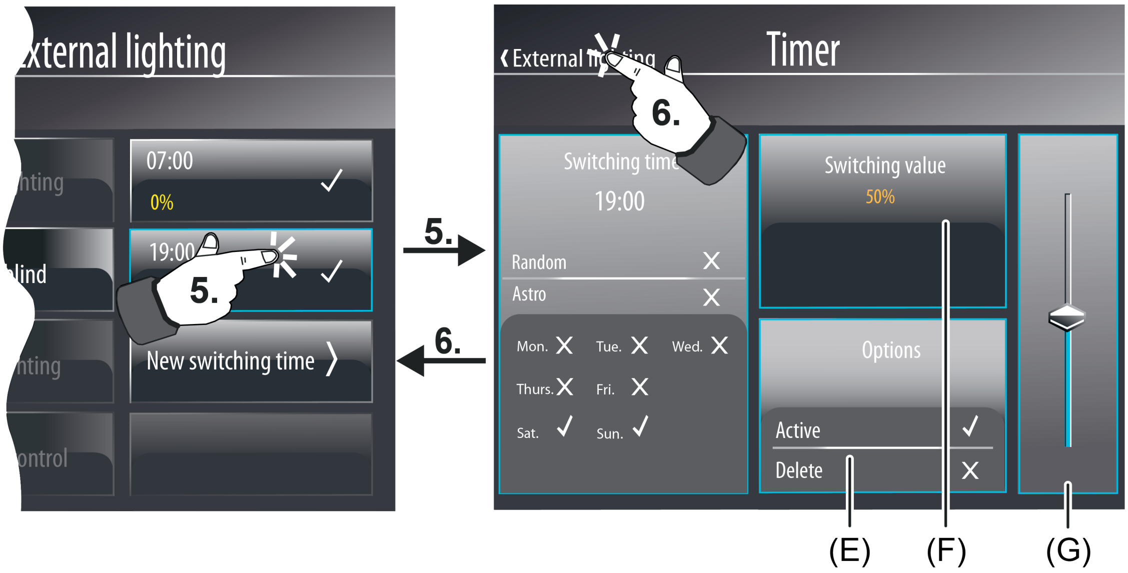

xternal lighting
hting
blind
hting
ontrol
07:00
0%
19:00
5.
New switching time
5.
6.
External lighting
6.
Timer
Switching time
19:00
Random
Astro
Mon.
Tue.
Wed.
Thurs.
Fri.
Sat.
Sun.
Switching value
50%
Options
Active
Delete
(E)
(F)
(G)

Figure 87: Example of a configuration page for switching times (right) - Data type timer switch channel "1-byte value"

(E) Control and display surface for active or inactive switching or for deleting the switching time

(F) With data formats "Switching", "Scene" or "Operating mode switchover": Display surface for the status indication of the switching command by text and icon.
With data formats "Value": Control and display surface for status indication of the switching value and for displaying the keyboard for the purpose of value presetting.

(G) Operating area for presetting a switching command
With data formats "Switching", "Scene" or "Operating mode switchover": Rocker control surface (up ON, down OFF)
With data formats "1-bit value" or "2-byte value": Value slider

When changing the command of the switching time using the rocker control surface, the change must be acknowledged via the value slider or keyboard (only for values) and saved in the device memory. Once a new command has been executed, the control surfaces "〈 Cancel" (highlighted in red) and "Save ✓" (highlighted in green) are visible in the status line. By pressing the "Save" surface, a new command is saved in the device memory and the system returns to the submenu of the timer switching channel. By pressing the "Cancel" surface, the old switching time command remains unchanged.

ⓘ When switching times are changed directly on the device by the user, the following should be observed:
User settings are saved in the non-volatile memory. Any changes made by the user directly on the device are preserved after a device reset (e.g. due to mains voltage return). The user presettings are preserved even after a programming operation of the device if settings for timer switch channels or switching times in the configuration software were not significantly changed.
If, however, elementary settings were changed in the configuration software, user settings for timer switch channels will be lost after a programming operation! User settings are then overwritten by the presettings of the configuration software as a result of the commissioning operation. The following settings in the configuration software reset user settings...
- Changes to the data types of timer switch channels
- Addition or removal of switching times for timer switch channels
- Restrictions of value limits (Minimum, Maximum)

You can define whether the function is active or not for each switching time. Only switching times that are set to "active" are processed by the device. Inactive switching times behave passively (no telegram transmission).
The state of a switching time can be influenced by pressing the control surface (E). Each time the control surface is pressed, the state switches over between "Active" (marker " ✓") and "Inactive" (marker "**X**"). Any change of the state must also be acknowledged here in the status line and saved in the device memory via the control surface "Save ✓". The last setting is discarded by pressing the control surface "〈 Cancel".

To return to the submenu of the timer switch channel when in the configuration menu, press the icon "〈" in the status line at the top edge of the screen (supplemented by the switching channel) (6).

4.2.4.9 Logical links

The device makes it possible to create and evaluate up to 80 logical link functions with up to 8 inputs and one link output the running time of the device. Inputs and outputs are executed as communication objects that can be linked to internal or external group addresses.
To add the configuration of an operation function, the node "Logic Editor" must be selected in the configuration software in the project bar. In the structure view it is then possible to add and configure logic gates. Each logic gate is given a name in the configuration software for added clarity, which can be changed by double clicking on the node in the structure view.

A logic gate consists of up to eight 1-bit input objects (E1...E8), which can be added by a mouse click, a 1-bit output object (A) and an optional disabling object. For each logic gate, the parameter "Link" can be used to select one of the logical functions AND, OR, exclusive OR or AND with return. Inputs and the output of a logic gate can optionally be evaluated inversely.

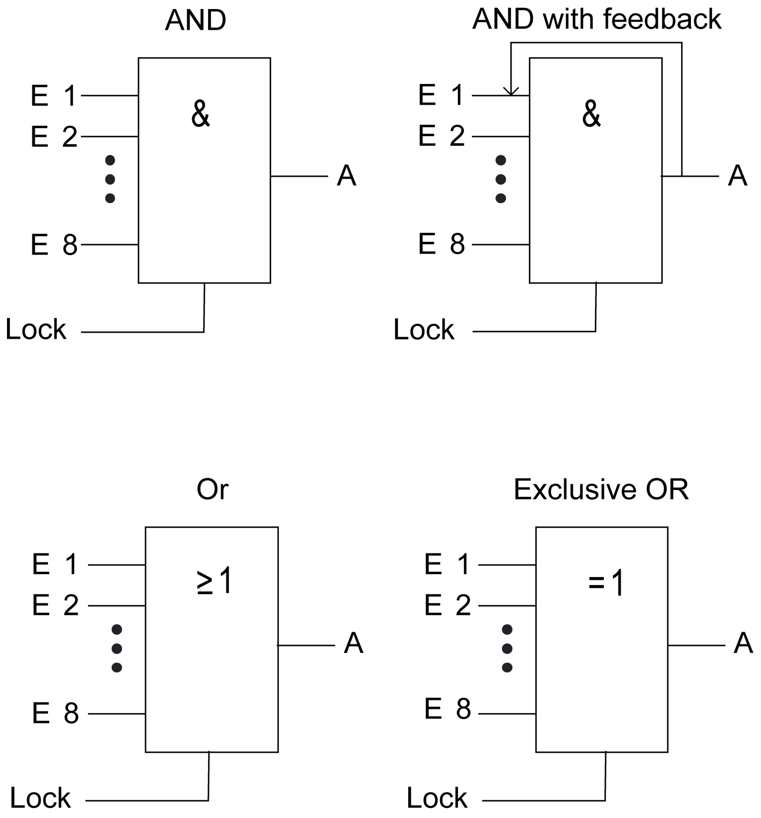


Figure 88: Link functions

ℹ With an "AND with return" the value of the output is fed back internally to input 1. The result of this is that the output can only be given the value "1" again if input 1 is set to "1" after the value "1" is also present on all of the other inputs. As soon as one of the other inputs is given the value "0", the output and thus input 1 are set to "0". If the return is carried out with an inverted output, the inversion is only processed after the return. Example: One application for this type of logic operation a light that should only be switched on manually after twilight falls. Here the pushbutton is linked to input 1 and the limiting value of the twilight sensor is linked to input 2. After the twilight sensor has set input 2 to "1", the pushbutton on input 1 can be used to switch on the light. If the user forgets to switch the light off again manually, when daylight comes the feedback ensures that input 1 is reset internally to "0". Without this feedback the light would be switched on again automatically at the next twilight.

Taking an example of three inputs, the following output statuses would be produced without inversion of the input signals or the output, according to the set link function...

E 1	**E 2**	**E 3**	**Output AND**	**Output OR**	**Output EX OR**	**Output AND with feedback**
0	0	0	0	0	0	0
0	0	1	0	1	1	0
0	1	0	0	1	1	0
0	1	1	0	1	0	0
1	0	0	0	1	1	0 *)
1	0	1	0	1	0	0 *)
1	1	0	0	1	0	0 *)
1	1	1	1	1	1	1

Output statuses of the logical link functions

*): Input 1 is automatically reset to "0" here.

The transmission behaviours of the output of a gate can be influenced in different ways...

- The parameter "Transmit on" of a gate together with the "Change the output" setting can reduce the bus load. In this case, telegrams are only transmitted when the logical status of the output changes. If, for example, the result of the link in time-monitored in a roller venetian blind actuator, it may be advisable to have the output transmit a telegram on each input event ("Each input event" setting).
- The gate can be disabled or enabled using the optional 1 bit disabling object. It is possible to set for which object value the disabling is active. The transmission behaviour of the logic gate can be defined after the block has been enabled. If, during a block, the input value is changed, then the output can automatically send a telegram, as soon as the block is lifted, or the gate waits until the next input telegram.
- The output also possesses a filter function. This sets whether it transmits each output value or whether it can only send "1" telegrams or only "0" telegrams.
- A switch-on delay and switch-off delay can be configured if required. Depending on the set time, telegrams of the output are transmitted to the bus after a delay depending on the result of the logical link ("1"-telegram or "0"-telegram). This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.
- Optionally, the output of a logic gate can transmit the status cyclically to the bus (e.g. for telegram monitoring in actuators). An output only transmits cyclically if the filter criterion is met (see above) In the case of configured switch on / or switch off delays, the status of the cyclical telegram first changes after a logical change in status after the delay time has elapsed.

4.2.4.10 Demultiplexer

The device has an integrated demultiplexer function. A demultiplexer forwards the value of an input object to one of two (type "1 to 2") or one of four outputs (type "1 to 4"). The output used depends on the state of the 1-bit control inputs.
Up to 7 demultiplexer functions from type "1 to 2" and up to 7 demultiplexer functions from type "1 to 4" can be created in the configuration software in the project bar under "Logic Editor". Each demultiplexer is given a name for added clarity, which can be edited by double clicking on the node in the structure view.

ⓘ The demultiplexer is purely a KNX function that does not become visible on the device on the graphic interface.

A demultiplexer supports the following data formats that can be set by the parameter "Object type Input/Output". Input and output objects always have the same data type...

- DPT 1.001 (switching, 1-bit)
- DPT 3.007 (Dimming 4-bit)
- DPT 5.001 … 5.004 (relative value 1-byte)
- DPT 5.010 (counter value, 1-byte)
- DPT 5.010 (counter value, 1-byte)
- DPT 6.010 (counter value with sign, 1-byte)
- DPT 7.001 (counter value, 2-byte)
- DPT 8.001 (counter value with sign, 2-byte)
- DPT 9.001...9.0021 (floating point value, 2-byte)
- DPT 12.001 (counter value, 4-byte)
- DPT 13.001 (counter value with sign, 4-byte)
- DPT 14.000 … 14.079 (IEEE float, 4-byte)

The following truth tables and figures describe the internal function of the multiplexers according to the type "1 to 2 demultiplexer" or "1 to 4 demultiplexer".

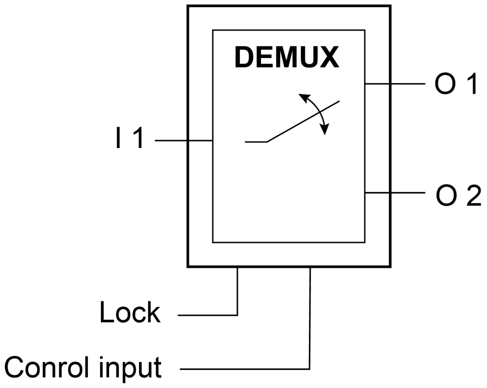


Figure 89: Demultiplexer "1 to 2"

Control input	Forwarding to
0	Output 1
1	Output 2

Selection of the output by control input for demultiplexer "1 to 2"

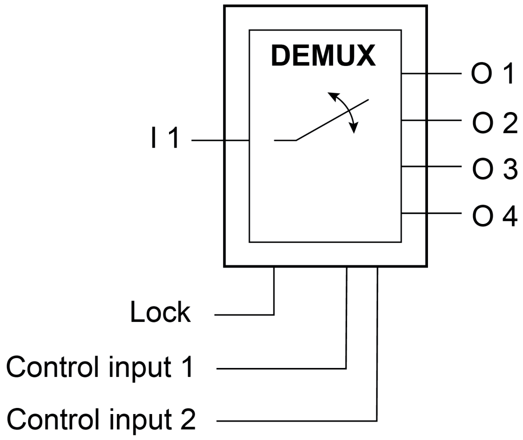


Figure 90: Demultiplexer "1 to 4"

Control input 2	**Control input 1**	**Forwarding to**
0	0	Output 1
0	1	Output 2
1	0	Output 3
1	1	Output 4

Selection of the output by control inputs for demultiplexer "1 to 4"

ⓘ When the control inputs change, the outputs do not transmit telegrams. Only when an input object receives a new value is it forwarded to the current output.

The demultiplexer can be blocked or enabled using the optional disabling object. It is possible to set for which object value the disabling is active. The behaviour can be defined after the block has been enabled. If the block is lifted, the output can automatically transmit a telegram or the demultiplexer waits until the next input telegram.

4.2.4.11 Timers

The device has the ability to create up to 40 timers. A timer allows the filtering of incoming 1 bit telegrams of a communication object, the delaying of switching statuses according to the switching edge and then forwarding via an output communication object. Both internal and external group addresses can be linked to the objects.
Timers can be added to the project design in the configuration software in the project bar under "Logic Editor". Each timer is given a name for added clarity, which can be edited by double clicking on the node in the structure view.

A timer consists of an input object, an output object and an optional disabling object. In the device software, the timer acts like a sluice with time delay and filter function. Depending on the value of the disabling object and the parameters, the value of the input object is either forwarded to the output object or is disabled.
The disabling object is a 1-bit communication object, whose behaviour (disable on 0, disable on 1) can be set in the parameters of a timer. If, during a block, the input value is changed, then the output can automatically send a telegram, as soon as the block is lifted, or it waits until the next input telegram.

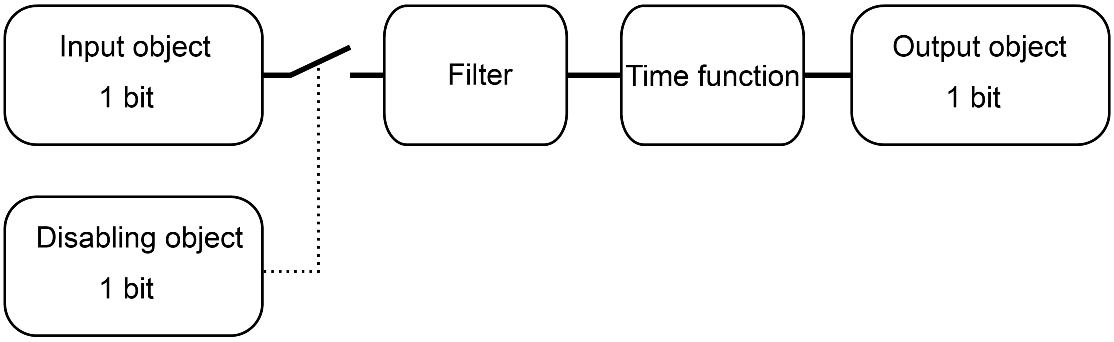


Figure 91: Elements of a timer

4.2.4.12 Limiting values

The device allows the limiting value monitoring of 1-byte, 2-byte and 4-byte values in different data formats. A maximum of 40 limiting value modules are available that can be created individually and configured in the configuration software under "Logic Editor" in the project bar. The limiting value modules have one value input object each. The value received via this object is compared continuously with the configured limiting values. Each limiting value module also has two limiting values each with 1-bit communication objects for monitoring a lower and upper limit. Alarm or message telegrams can be transmitted to the bus via these 1-bit objects if the lower or upper limiting value was fallen short of or was exceeded in each case.

A limiting value module has the following characteristics and parameters...

- "Datapoint type":
  This parameter defines the data format of the input communication object. Depending on this setting, other parameters are visible which define the display format and unit of the value for displaying the user settings directly on the device ("Settings -> Limiting values") and which also define the format of the input field of the limiting values in the configuration software.
- "Transmit limiting value on initialisation":
  If this parameter is set, the device evaluates the input value immediately after a device reset (commissioning operation or bus voltage return) and initialises the 1-bit limiting value objects. Consequently, the 1-bit limiting value objects also send the current state to the bus.
- "Upper limiting value active" and "Lower limiting value active":
  This parameter can define whether the input value is monitored at a lower and upper limit.
- "Upper limiting value" and "Lower limiting value":
  These parameters define the limiting value to be monitored if these are activated. The limiting values predefined here can be changed on the device at any time directly in the user and system settings and can therefore be adapted to individual needs or requirements. The formatting of the values in the input field of the configuration software and in the presetting during the course of the user settings directly on the device is defined by the lower level parameters of the data point type (offset, factor, format).
- "Hysteresis upper limiting value" and "Hysteresis lower limiting value":
  A hysteresis is assigned to each limiting value. The hysteresis serves to prevent frequent switching backwards and forwards when there is a measured value in the approximate area of the limiting value (figure 93). The setting "0" deactivates the hysteresis (figure 92). In the case of the upper limiting value, the hysteresis is deducted from the limiting value. In the case of the lower limiting value, the hysteresis is added to the limiting value. The hysteresis - like the limiting value itself - is an absolute value and is only defined in the configuration software.

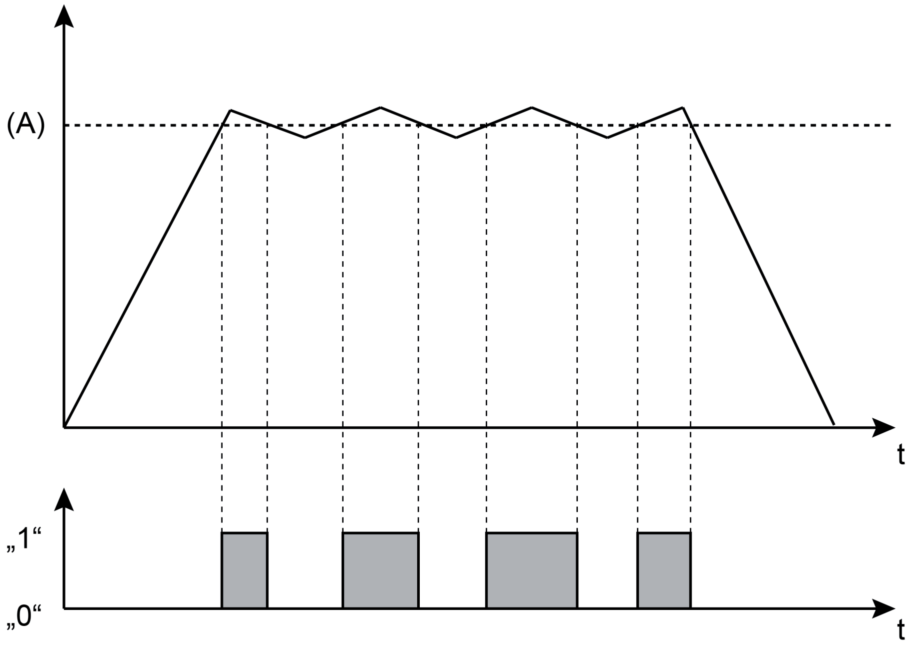


Figure 92: Example of a limiting value without hysteresis

(A) Limiting values that have been configured or set directly on the device

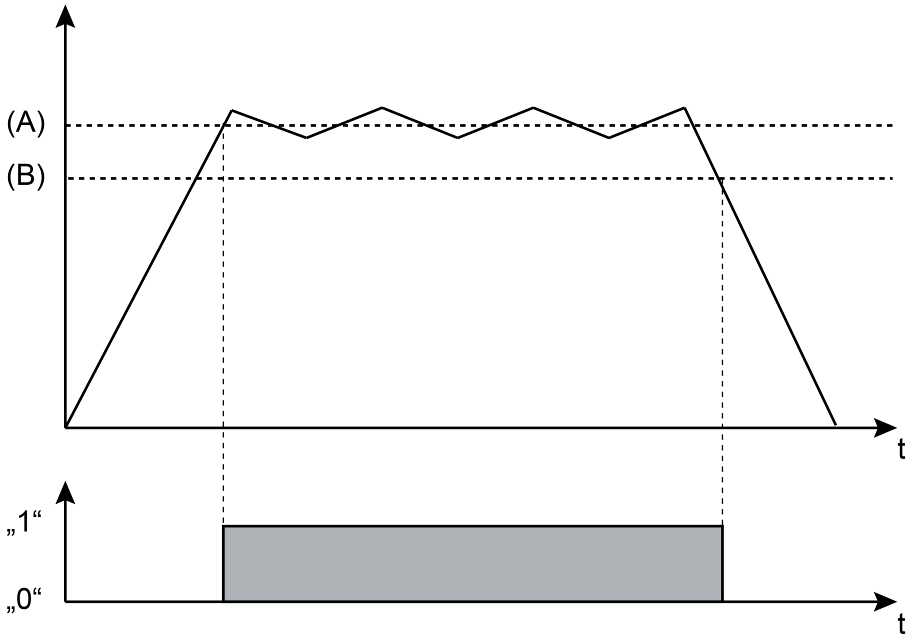


Figure 93: Example of a limiting value with hysteresis

(A) Limiting values that have been configured or set directly on the device (here: upper limiting value)

(B) Hysteresis

- "Behaviour on exceeding the upper limiting value", "Behaviour on not reaching upper limiting value – hysteresis", "Behaviour on not reaching lower limiting value", "Behaviour on exceeding upper limiting value + hysteresis":
  These parameters define the switching commands transmitted to the bus via the 1-bit limiting value object. The device compares the current input value continuously with the set limiting values and hystereses and decides on this basis which switching command should be transmitted.
- "Transmission delay upper limiting value" and "Transmission delay lower limiting value":
  The switching telegrams of the limiting value object can be transmitted to the bus after a delay if required. This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.
- "Upper limiting value changeable" and "Lower limiting value changeable":
  The limiting values can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the individual limiting values in the configuration software are configured as changeable here.
- "Upper limiting value changeable externally" and "Lower limiting value changeable externally":
  Limiting values can also be optionally changed externally via a communication object. If these parameters are set, communication objects are also available that can change the limiting values during the running time of the device. The data format of these objects corresponds to the datapoint type of the limiting value set in the configuration software.

4.2.4.13 e-mail

4.2.4.13.1 Introduction

If the device is connected to a network via the Ethernet interface and the IP communication parameters are set correctly in the Windows® operating system, the E-Mail function can be used. e-mail is a service in computer networks allowing electronic messages to be exchanged between a sender and one or more recipients. Alongside the World Wide Web (www), e-mail is the most currently used service on the Internet.
The device is also able to send e-mail messages. To use this function, the device operator must have a valid e-mail account in a local network or the Internet. Most Internet Service Providers (ISP) usually offer their customers e-mail accounts.

The configuration of the e-mail accounts takes place directly on the device in the user and system settings (see page 140-141). In this way, the device operator can configure his e-mail account at any time and independently of the ETS or configuration software.

ℹ The receipt and display of e-mails is not within the scope of functions of the KNX application.

4.2.4.13.2 Sending e-mail messages

Sending e-mail messages

The device is able to send predefined texts as "event e-mails". The text contents of the event e-mail as well as the recipient address are specified in the configuration software by the project planner before the device is commissioned. Sending of texts is triggered by switching telegrams, which receive either KNX group addresses or internal group addresses.

The event mails are configured in the configuration software when the entry "E-Mail" is selected in the project bar. Up to 50 event mails can then be created in the structure view. A 1-bit communication object is shown for each event e-mail.

Within the parameters of an event e-mail, the project planner specifies the following properties...

- "Send e-mail on":
  "Definition of the telegram polarity for the object of the corresponding event e-mail. The e-mail is sent when a telegram is received with the polarity defined at this point. Telegrams with another polarity are rejected.
- "Recipient":
  Specification of the e-mail address of a recipient of the event e-mail. The standard input format of the address is specified as "local@domain" (example: "xxx@yyy.de").
- "Subject":
  Specification of the subject text of the event e-mail (e.g. "Signalling system fault", "Heater frost protection", ...). The text may be a maximum of 20 characters in length.
- "Message":
  Specification of the the text contents of the event e-mail. The specified contents text is later transmitted to the mail server as (plain text) in the event mail, and is displayed in the same manner, without special formatting, when the message is opened.

To enable the device to send e-mails, a valid SMTP mail server (Simple Mail Transfer Protocol) must be entered in the device configuration. The SMTP configuration is possible with the general device parameters in the configuration software as well as later directly on the device in the user and system settings.

ℹ After a device reset (return of mains power supply, commissioning operation), the device first initialises the Ethernet interface. e-mails can only be sent when this initialisation operation has been completed (if necessary using DHCP). After a device reset, this is usually possible after approx. 1 minute.

ℹ The device encodes the text characters of an email message in Unicode (UTF-8).

Sending the data values of the datalogger by e-mail message

If a datalogger channel is configured in the configuration software, the recorded data values can be sent cyclically by e-mail. In this case, the device prepares the recorded data in a CSV file and sends it to a specified recipient in a standard e-mail. Both the e-mail function and the recipient address can be configured in the configuration software with the parameters of a datalogger channel. The e-mail is sent automatically each time the number of data records stored in the file system reaches 10,000. A data record consists of the minimum value, maximum value, average value and the last value (for calculating a difference) of a time interval.

If the device is connected to a network via the Ethernet interface and the IP communication parameters are set correctly in the Windows® operating system, the E-Mail function can be used. e-mail is a service in computer networks allowing electronic messages to be exchanged between a sender and one or more recipients. Alongside the World Wide Web (www), e-mail is the most currently used service on the Internet.
The device is also able to send e-mail messages. To use this function, the device operator must have a valid e-mail account in a local network or the Internet. Most Internet Service Providers (ISP) usually offer their customers e-mail accounts.

The configuration of the e-mail accounts takes place directly on the device in the user and system settings (see page 140-141). In this way, the device operator can configure his e-mail account at any time and independently of the ETS or configuration software.

ⓘ The receipt and display of e-mails is not within the scope of functions of the KNX application. Separately installed components of the Windows® operating system can be used for this purpose (e.g. Outlook Express, Windows Mail).

4.2.4.14 Datalogger

Introduction

The datalogger offers the option of recording KNX data - for example temperature values, command values, lighting status, etc. - in various formats in the device memory and of showing them in a value-time diagram on the display. In so doing, the data telegrams received from the KNX are "compressed" at set intervals and saved in a datalogger channel of the device as minimum and maximum average values and can be displayed as required. It is optionally possible to also represent average values of the recorded data values.
The datalogger is primarily subdivided into the function modules "Datalogger recording" and "Datalogger display".

4.2.4.14.1 Datalogger recording

The KNX data are saved in a datalogger channel. A maximum of 20 datalogger channels can be inserted in the device configuration by selecting the entry "Datalogger" in the configuration software in the project bar. After that, new channels can be added in the structure view. Each datalogger channel is given a name for added clarity, which can be edited by double clicking on the node in the structure view.

Communication object and data format:
Each datalogger channel possesses a communication object. The data format of this object can be specified using the parameter "Datapoint type". The following data formats are available...

- DPT 1.001 (switching, 1-bit)
- DPT 3.007 (Dimming 4-bit)
- DPT 5.001 … 5.004 (relative value 1-byte)
- DPT 5.010 (counter value, 1-byte)
- DPT 6.010 (counter value with sign, 1-byte)
- DPT 7.001 (counter value, 2-byte)
- DPT 8.001 (counter value with sign, 2-byte)
- DPT 9.001...9.0021 (floating point value, 2-byte)
- DPT 12.001 (counter value, 4-byte)
- DPT 13.001 (counter value with sign, 4-byte)
- DPT 14.000 … 14.079 (IEEE float, 4-byte)

Interval time:
Telegrams reaching the communication object are divided into various time intervals and assigned to them. At the end of each time period, the telegrams received are evaluated and a minimum and maximum interval value determined. In addition, an average value is calculated and saved. To evaluate a differential calculation, the last respective data value of an interval is also saved.
The smallest and largest values are evaluated as the minimum and maximum values. To calculate the average, the recorded values are totalled and divided by the number of recorded values. If, within a time period, only one telegram data value was received, then the minimum value = maximum value = average value.

The time interval for the detection of data telegrams can be configured separately by the parameter "Interval time" for each datalogger channel. The following interval times are configurable...

- "Minute"
- "Hour"
- "Day"
- "Week"

- "Month"

ⓘ The user defines the scaling of the time axis (X axis) in the value-time diagram when reading the diagram. For this purpose, a selection of the following settings is provided in the diagram display directly on the device: "Hour", "Day", "Week", "Month", "Year".
The time axis in the diagram is shrunk or stretched depending on this setting. The setting thus defines the number of time intervals taken into account in the diagram and therefore the number of visible data values.
Example: The time axis is set to one hour. The time intervals of the previous hour are displayed in the diagram. The diagram then displays, for example, 60 data values of a datalogger channel with a time interval of one minute if at least one data value could also actually be recorded in each time interval.

ⓘ If, within a period of time, no telegram could be received and evaluated, then the corresponding interval is considered "invalid". The characteristic curve is thus interrupted in the value-time diagram of the on-screen display. To prevent such behaviour, the data value sources - such as the room temperature controller, weather stations, etc. - should transmit the telegram data value cyclically to the bus with a cycle time which is considerably shorter than the set time period. At least two telegram data values should be received in a time interval. The evaluation of the minimum, maximum and average values becomes more accurate, the more telegrams are received in the time period.

Cyclic polling:

During data recording, regular incoming telegrams (ValueWrite) or value responses or a cyclic poll (ValueResponse) can be evaluated. Cyclical polling of the object value can be activated separately for each datalogger channel. With activated cyclic polling, the device transmits a value read telegram (ValueRead) to the bus regularly, after a period of time has elapsed. The data source must then return a value response telegram (ValueResponse). The "Read" flag must be set on the transmitting object of the data source for this to function correctly.
The time interval of a cyclic poll can be defined in the configuration software. The setting options automatically align themselves to the configured interval time. This ensures that at least one data value is requested within a time period.

ⓘ The device makes a distinction between normal telegrams (ValueWrite) and value response telegrams. With activated cyclic polling, the minimum, maximum and average values are added to the value responses. In this case, additional spontaneous telegrams are only given the maximum and minimum values.

ⓘ Cyclic polling is preferable for even average formation.

Processing and saving the data:

The data values received from the bus are transmitted to the datalogger display as minimum, maximum and average values by the KNX function part (BCU) at the end of a time interval. To calculate the differential value (see next section) the last respective value of a time interval is also forwarded to the display. The value cannot be transmitted to the datalogger display as long as the device is in standby mode. In this case, the KNX function part saves the calculated data values. If the memory is no longer sufficient to save additional data values, the KNX function part starts the application of the device automatically and thus terminates the standby mode. This ensures that no data values are lost.

ⓘ The device cannot be started automatically for the transmission of the data values from the KNX function part if it was switched off by the user (operating system shut down). In this case, the transfer of the calculated data values does not occur. As a result, the oldest data values stored in the KNX function part are overwritten by new values (ring memory) whereby display values are lost.

The data values first stored in the KNX function part are only saved temporarily and after a device reset (power failure, commissioning operation) are lost. In general, only the data of completed time intervals are saved or transmitted to the datalogger display. Temporary data for unfinished time periods is not taken into account when saving or forwarding.
Data values that could be transmitted from the KNX function part to the datalogger display are

saved permanently in the device's file system. Consequently, data values that were transmitted successfully to the display are not lost after a device reset.

- ⓘ The datalogger remains active even when the device is switched off (operating system has been shut down) or is in the idle state. The KNX function part (BCU) is functional as long as mains voltage and bus voltage are switched on.
- ⓘ After a commissioning operation, the data values stored in the file system are preserved if the parameterisation of a datalogger channel has not significantly changed. In this case, data values recorded previously are still available even after the commissioning.
  If, however, the parameterisation of a datalogger channel was changed (data type or interval type modified), the stored data values are then discarded. The recording of data values then begins once again whereby the display is filled gradually with new values.

Differential calculation:

If the data source is a counter (e.g. electricity meter, people counter, etc.), the data display in the value-time diagram can be configured to differential calculation. A difference between the last value to arrive of the current interval and the last valued of the previous interval - depending on minimum, maximum or average value - is calculated here and displayed as a differential value, provided that the diagram is configured to differential display. The calculated data value differentials then, in the case of an electricity meter, directly represent the consumed units of power within a recording period (e.g. month or year).

To ensure that the differential calculation produces useful display values, only those counter values should be used as data which are counted in one direction (either increasing or decreasing). In addition, differential calculation with data values not from counters is usually meaningless and thus impracticable. Therefore, differential calculation should only be displayed for data channels that have "Counter" configured as the object data type.

After a device reset (power failure, commissioning operation), the differential calculation should start at a specified starting value. This is required in order to initialise the differential calculation so that a differential value can be calculated when starting the data recording after a reset. This means that, in addition, there can be an adjustment to defined basic counter levels - for example after the installation of a new electricity meter.

The system project planner must enter the starting value in the configuration software for the parameters of a datalogger channel. This means that it is stored statically in the device project planning. The following points should be observed:

If a value is entered in the parameter box, the device then evaluates the last data value of the first time period after the reset directly and then shows the difference to the starting value in the display diagram . Alternatively, no start value can be defined. In this case, the device automatically evaluates the first data value received as the start value. This value does not appear in the data display. Only the differential values calculated after this
(last value of 1st period <-> last value of 2nd period, etc.) are transferred to the display as display values.

- ⓘ With a set cyclic poll of the channel object, only the response telegrams (ValueResponse) of the data source are used to record the differential data. Additional spontaneous telegrams (ValueWrite) are not taken into account in a differential evaluation.

e-mail at datalogger:

If the device is connected to a network via an Ethernet connection and an e-mail account is configured to send e-mail messages, the data values recorded by a datalogger channel can be sent cyclically by e-mail. In this case, the device prepares the data in a CSV file and sends it to a specified receiver in a standard e-mail. Both the e-mail function and the recipient address can be configured in the configuration software with the parameters of a datalogger channel.

The e-mail is sent automatically each time the number of data records stored in the file system reaches 10,000. A data record consists of the minimum value, maximum value, average value and the last value (for calculating a difference) of a time interval.

4.2.4.14.2 Datalogger display

The data values recorded in a datalogger channel are displayed as a continuous characteristic curve in a value-time diagram. The device can display up to 20 different datalogger diagrams. The datalogger diagrams are available on a separate datalogger page. The datalogger page is opened via the function view in the main menu level (predefined display structure). To do this, press the tile with the ▐▌ symbol (1.).

As soon as the datalogger page is opened, a list of all datalogger diagrams created in the device will be displayed (figure 94). Up to 4 datalogger diagrams are displayed simultaneously. If more than 4 diagrams have been created, the list can be switched by the sensor surfaces ﹀ / ︿.
The control surface of a datalogger diagram bears the text of the diagram (A). This text is used for the purpose of clear identification and can be assigned individually in the configuration software. Furthermore, any additional text can be displayed in the operating element (B). This additional text can optionally describe the displayed data values in the diagram (e.g. "Heating command value").
The diagram display is recalled by pressing the control surface of a datalogger diagram (2.) (figure 95).

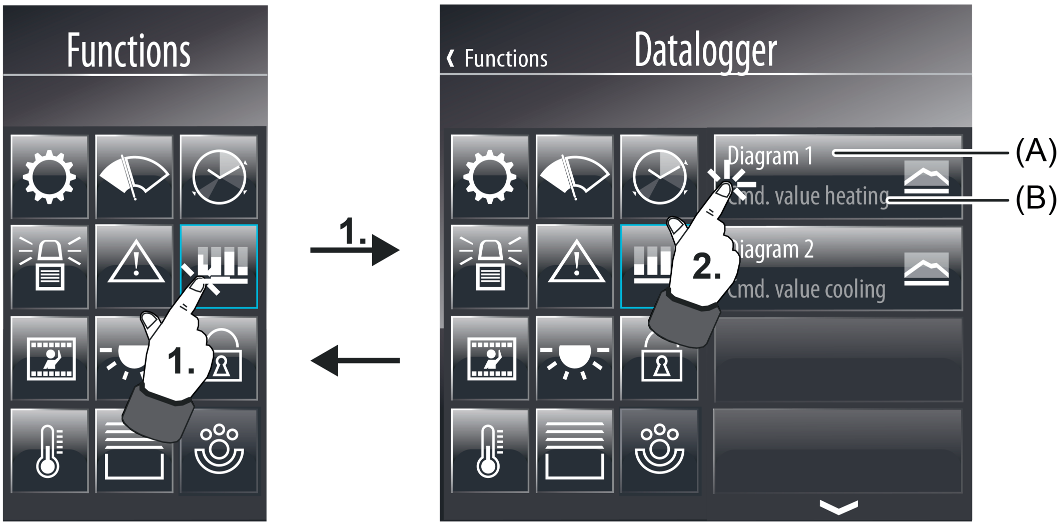


Figure 94: Example of a datalogger page in the function view (right)

(A) Text of the datalogger diagram (configurable)

(B) Additional text of the datalogger diagram (configurable)

Up to 3 datalogger channels can be displayed as curves in a diagram. The curves to be displayed are selected using the parameters "Curve 1", "Curve 2" and "Curve 3".

ⓘ Only channels with the same interval times can ever be displayed within a datalogger diagram! The selection of the parameters adapts itself accordingly.

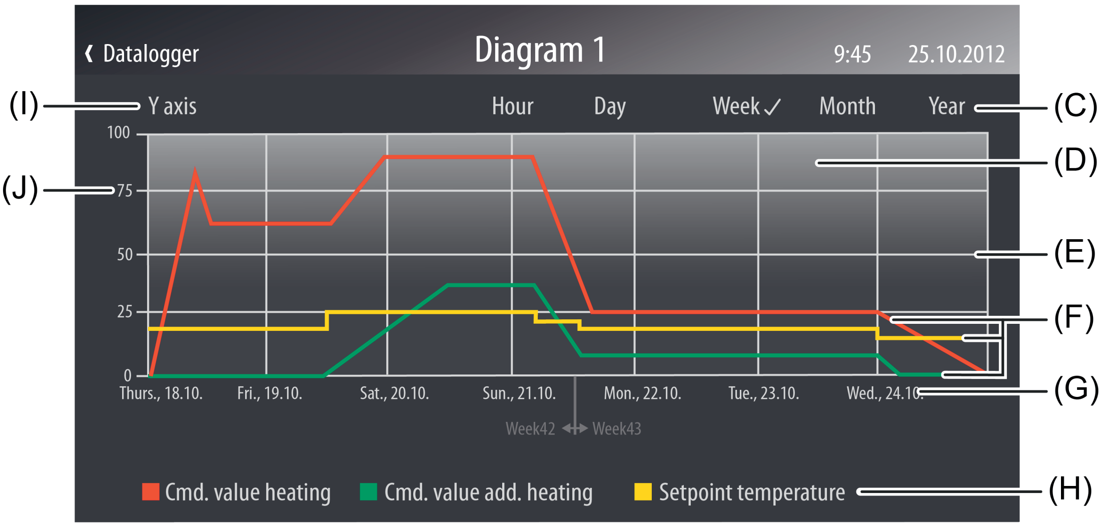


Figure 95: Example of a datalogger diagram with 3 curves

(C) Setting for the scaling of the time axis (X axis)
(D) Display surface of the value-time diagram
(E) Subdivisions of the Y axis for subdividing (number configurable)
(F) Curves (1...3)
(G) Labelling of the time axis (X axis) depending on the setting of the axis scaling
(H) Legends of the curve colours for assignment of the data values by curve names (visibility and curve names are configurable)
(I) Title of the Y axis (visibility and curve names are configurable)
(J) Labelling the Y axis (visibility and format of the labelling are configurable)

The user defines the scaling of the time axis (X axis) in the diagram (D). For this purpose, a selection of the following settings is provided in the diagram display (C): "Hour", "Day", "Week", "Month", "Year".
The time axis in the diagram is shrunk or stretched depending on this setting. The setting thus defines the number of time intervals taken into account in the diagram and therefore the number of visible data values.
Example: The time axis is set to one hour. The time intervals of the previous hour are displayed in the diagram. The diagram then displays, for example, 60 data values of a datalogger channel with a time interval of one minute if at least one data value could also actually be recorded in each time interval.
The setting options are adapted to the time interval of the curves displayed in the diagram. Hence, the "Hour" setting, for example, can only be selected if the time interval is set to "Minute".

The Y axis can be scaled dynamically according to the values to be displayed (specified by minimum and maximum values) or, alternatively, can be permanently configured in a value range. If the scaling of the Y axis is fixed, and there is a data value outside the specified minimum or maximum limits, then the data value curve is drawn in vertically upwards or downwards from the two neighbouring data points.
The Y axis can be given subdivisions (E) to simplify legibility of the diagrams. The subdivisions of the X axis are predefined by the scaling. The title of the Y axis (I) and the visibility and formatting of the axis labelling (J) can also be configured. In addition, the heading of the diagram and the names (H) of the curves (F) are defined in the parameterisation.

"Gain" and "Offset" can be added to the measured values of a channel to allow the option of modification of the desired measured value ranges in the diagram. In addition, it is necessary to specify in the parameters of a datalogger diagram which data value is to be displayed in the diagram as the "curve type" (maximum value, minimum value, average or differential value).

ℹ Within a diagram, the characteristic curve created from the data values runs from right to level parallel to the time axis.

ℹ If, within a period of time, no telegram could be received and evaluated, then the corresponding interval is considered "invalid". The characteristic curve is thus interrupted in the value-time diagram of the on-screen display.

ℹ In a diagram, the values of a datalogger channel are displayed without reformatting in the way they were received in the data telegram from the bus, providing that no gain or offset is specified in the configuration of the curve. As a result, a data value, for example, received in the format DPT 5.001 (1 byte value) in a value range of 0...255 can be displayed in the diagram. If, in this example, percentage values should be displayed
(e.g. command values), the data values can be reformatted by the reinforcement. In such a case, a 1 byte data value (0...255) with a gain of "0.392" can be converted to a percentage data value (0...100 %). This gain should then be entered in the parameter of the same name of the curve concerned in the configuration software.
An offset causes a shift of the appropriate curve upwards on the Y axis (positive offset) or downwards (negative offset).

4.2.4.15 Presence simulation

Introduction

The presence simulation can give a person outside the impression that a house or office block is occupied, especially when there is no-one inside. The owners or operating personnel can record any simulations, for example for lighting or shading, over periods of time and play them back when they are not there.
The recording records KNX telegrams in the 1-bit and 1-byte data formats and temporarily saves them with time and weekday information. On playing back, the previously saved telegram sequence can either be played back with accurate times or, alternatively, with accurate times and weekdays.
The presence simulation is operated on a separate display page. The display page of the presence simulation is opened via the function view in the main menu level (predefined display structure). To do this, press the tile with the ▶ symbol (1.).

As soon as the display page of the presence simulation is opened, 4 control surfaces that execute various functions appear in the display (figure 96).

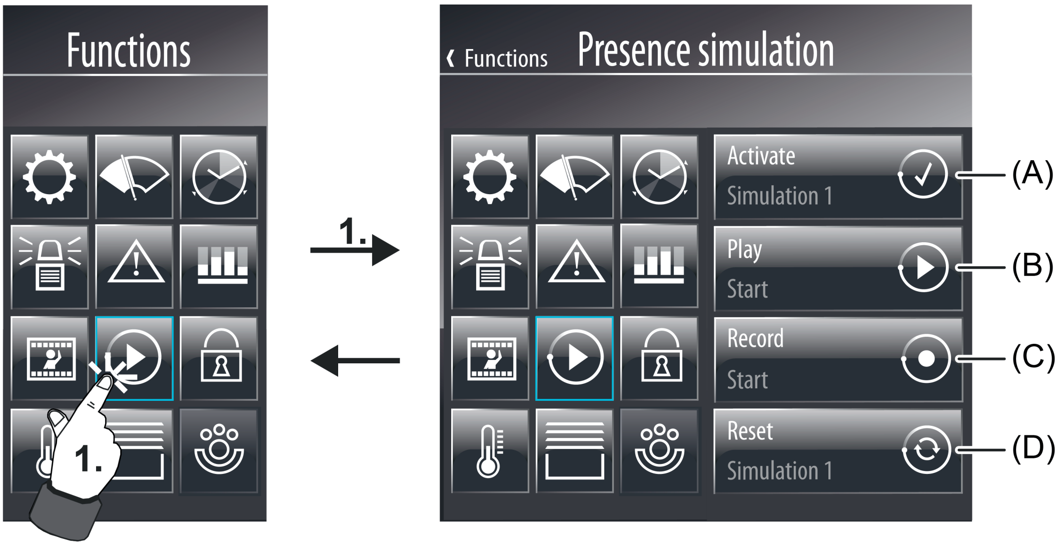


Figure 96: Example of a display page of the presence simulation in the function view (right)

(A) Display and control surface for activating a simulation (1...8)
(B) Display and control surface for playing back the activated simulation (only available if a simulation was activated and recorded)
(C) Display and control surface for recording the activated simulation (only available if a simulation was activated)
(D) Display and control surface for resetting the activated simulation (only available if a simulation was activated)

The presence simulation is configured and operated sequentially in these steps...

- Configuration of the data points in the configuration software (see page 199-200),
- Activation of a simulation (see page 201),
- Assignment of the functions (see page 201),
- Recording of a simulation (see page 203-204),
- Playback of a simulation (see page 204).

4.2.4.15.1 Configuring functions

The presence simulation records KNX telegrams and plays them back at a later time when required. To ensure that recording and playback is possible, the system project planner must create special functions in the configuration software that are independent of the rest of the device configurations and assign them to the presence simulation. A function can be added by selecting the entry "Presence simulation" in the configuration software in the project bar and then pressing the "Add function" button in the work area. Up to 32 functions can be created in this way.

Exactly one communication object is assigned to each function. The data format of these function objects can be configured individually. The two formats "DPT 1.001 (i bit switching)" and "DPT 5.001...5.004 (1 byte value)" are available.
A clear designation can be assigned to a function (e.g. "Seating group light" or "Roller shutter living room"), which can later be read off on the device by the system operator for assigning the functions to a simulation. Additional parameter configurations are not required in the configuration software for the presence simulation.

4.2.4.15.2 Using presence simulation

Activating simulation

A simulation must first be activated before the presence simulation can be used. The presence simulation of the device distinguishes up to 8 different simulations. This allows the user to select the functions as required and adapt them to specific events (e.g. "Simulation holiday", "Simulation short absence", "Workshop weekend"). A simulation can be activated when the control surface (A) is pressed (2.). After that, the display shows a list of the simulations available and those that are not yet used (figure 97). A simulation can be selected and activated by briefly pressing the control surface of a simulation in the list (3.).
If a recording already exists for the selected simulation, the operating element displays the text "recorded". The text "No recording" is displayed until a telegram is recorded for the selected simulation.

To return to the overview page of the presence simulation, press the icon " ❬" in the status line (4.). This icon is supplemented by the name of the page that can be configured in the configuration software.

ⓘ If the control surface of a simulation in the list is pressed for a long time, the on-screen keyboard is displayed where the name of the simulation can be changed. In this way, clear labelling of the simulation is possible.

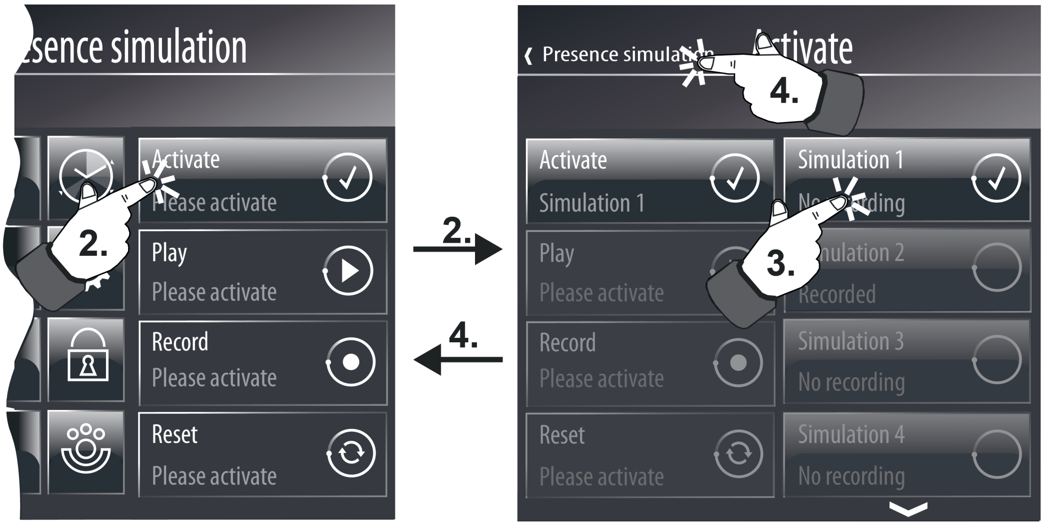

sence simulation
Activate
Please activate
Play
Please activate
Record
Please activate
Reset
Please activate
2.
2.
4.
❬ Presence simulati
ctivate
4.
Activate
Simulation 1
Simulation 1
No recording
3.
Play
Please activate
mulation 2
Recorded
Record
Please activate
Simulation 3
No recording
Reset
Please activate
Simulation 4
No recording

Figure 97: Example of a display page for activation of a simulation (right)

ⓘ The text "Please activate" appears in all operating elements until a simulation is selected via the control surface (A). In this status, it is not possible to use the presence simulation.

ⓘ After activating a simulation, the corresponding datasets are transferred to the KNX function part of the device so that a presence simulation can be executed even if the device - for example as in the case of prolonged absence - is in the idle state. The transmission operation takes some time, particularly in the case of simulations with many stored telegrams. The device is not operational during this time.

Select functions

Before a simulation can be recorded, the functions must be selected which are to be integrated in the presence simulation. Functions must already be created in the device configuration and linked with group addresses beforehand so that they can be assigned to a simulation. The term "Functions" is used alternatively here for the name "Objects", since the switching or value objects configured in the project design activate specific functions, such as switching lights or controlling a shading situation.

The functions of a simulation can be selected when the control surface (C) is pressed (5.). After that, 4 additional operating and display elements appear in the display (figure 98).

ℹ The control surface (C) can first be operated when a simulation has been activated.

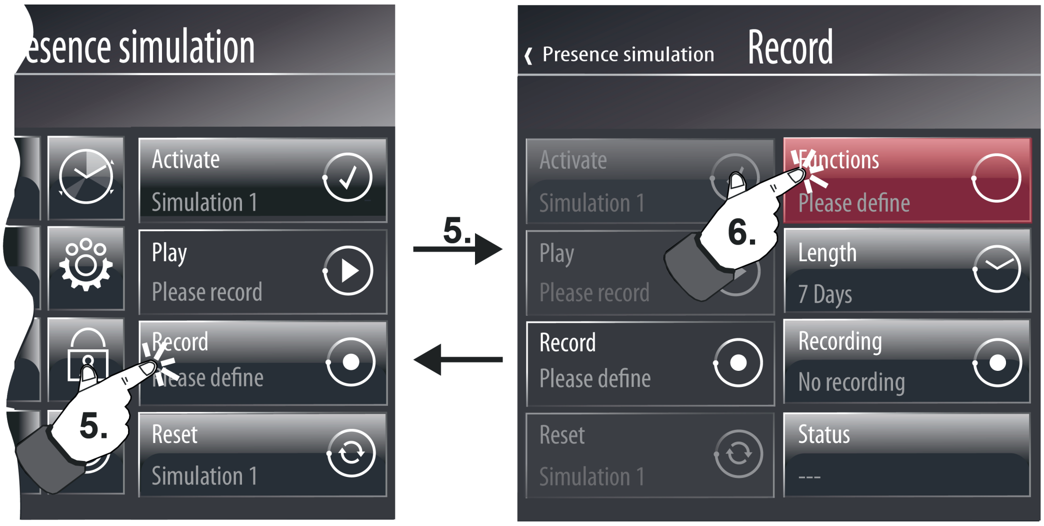
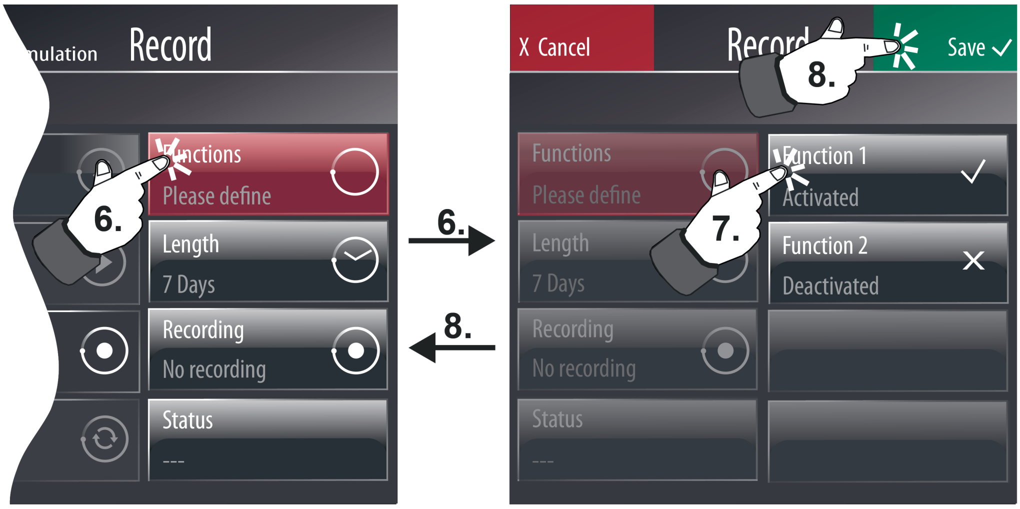

esence simulation
Activate
Simulation 1
Play
Please record
Record
Please define
Reset
Simulation 1
5.
5.
Presence simulation
Record
Activate
Simulation 1
Functions
Please define
6.
Play
Please record
Length
7 Days
Record
Please define
Recording
No recording
Reset
Simulation 1
Status

Figure 98: Example of a display page for opening the dialog for selecting functions (right)

ℹ The text "Please define" appears in the control surface (C) until a function is added for a simulation. If functions should already have been defined, the text "Please record" is displayed until the selected simulation has been recorded. It is first possible to play back the simulation after a successful recording.

The dialog for selecting functions is opened by pressing the control surface "Functions" (6.) (figure 99). A list of all configured functions (1...32) of the presence simulation then appears. The corresponding function can be activated and thus added to the simulation by pressing the control surface of a function (7.). In this way, up to 15 functions can be assigned to a simulation. The selection must then be confirmed (8.) by pressing the the control surface ✓ "Save". The function selection is discarded by pressing the "X Cancel" control surface.
To return to the display in the menu for recording the simulation, press "❬ Record" in the Status line.


nulation
Record
Functions
Please define
6.
Length
7 Days
Recording
No recording
Status

6.
8.
X Cancel
Record
8.
Save ✓
Functions
Please define
Length
7 Days
Recording
No recording
Status

Function 1
Activated
7.
Function 2
Deactivated

Figure 99: Example of a display page for selecting functions (right)

ℹ The function selection is only saved temporarily in the RAM of the device, meaning that a new selection is required (every function deactivated) and a resave is required after a power failure or commissioning operation.

ℹ If the function selection is changed and resaved after a simulation has been recorded, then the previous recording is deleted. The operator must then record a new simulation (see next section).

Recording a telegram sequence

After the operator has selected the functions of the presence simulation, the telegram sequence can be recorded. For this, the operator must first specify a maximum recording period in days. A simulation recording usually takes place independently in the background. The length of the recording period is used to specify when the simulation recording stops automatically after starting. A recording can also be stopped manually at any time regardless of this.

The length of the recording period can be edited via the displayed numeric keypad (figure 100) after tapping the control surface "Duration" (9.). Time periods from 1...7 days can be configured. A day is not a calendar day but a 24 hour period.
Example: if the recording begins on Tuesday at 9:00, the first day of the recording will end on Wednesday at 8:59. The start time of the recording thus specifies the start of a day, i.e. of a 24 hour period.

ℹ Before starting recording, ensure that the time and weekday of the device is set correctly!

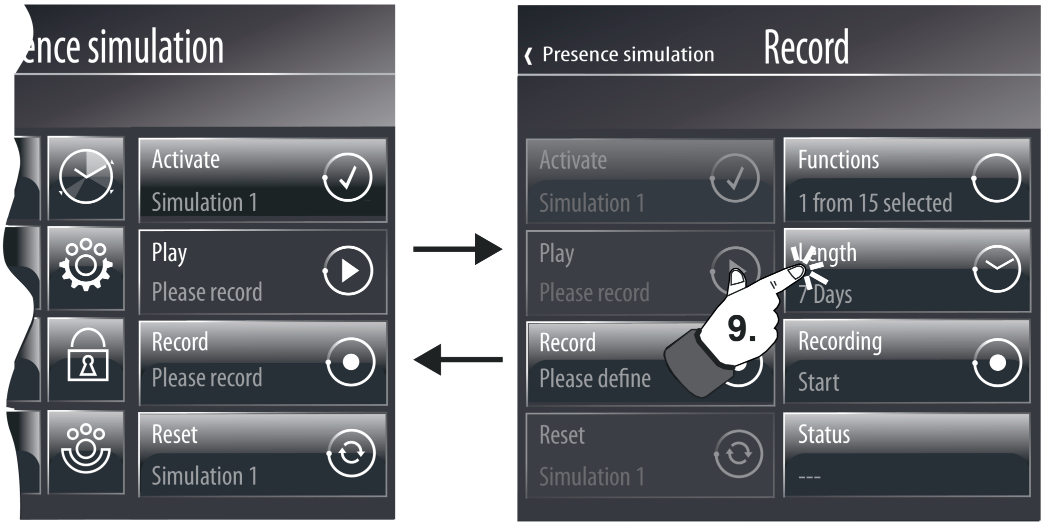


Figure 100: Example of a display page for setting the recording period (right)

ℹ During the recording phase, changes to the time (externally by the communication object per IP (SNTP) or direct adjustment on the device) should be avoided so as not to influence the end of the specified recording period during an automatic recording. For this reason, a simulation recording should not take place during a change from summer to winter time. Example: the recording period is specified as 1 day (24 hours). The recording is started at 8:00 on the first day. If the time were to continue normally, it would be stopped automatically at 7:59 on the next day. If, during the recording phase, the time is put back by 1 hour, then the recording would run for 24 hours but, on account of the new time, would end at 6:59 on the second day. Thus it may occur that telegrams between 7:00 and 7:59 are not recorded or there are time overlaps in the recorded telegram sequence.

The recording can be started by tapping the "Record" button (10) (figure 101). This requires that at least one function was selected beforehand. Icon and status text of the operating and display element thus change the status whereby a started recording process is displayed.

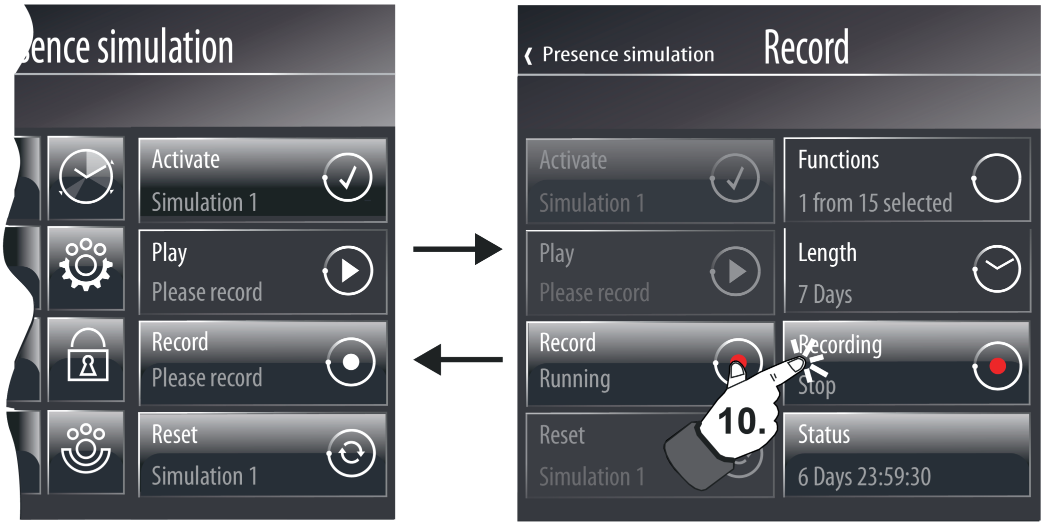

ence simulation
Activate
Simulation 1
Play
Please record
Record
Please record
Reset
Simulation 1
Presence simulation
Record
Activate
Simulation 1
Functions
1 from 15 selected
Play
Please record
Length
7 Days
Record
Running
Recording
Stop
Reset
Simulation 1
Status
6 Days 23:59:30
10.

Figure 101: Example of a display page for starting and stopping a telegram recording

The recording takes all the incoming telegrams of all the selected functions into account and saves them temporarily to the RAM of the device. A maximum of 2,100 telegrams can be recorded. Should a larger amount of telegrams have been reached before the set recording time has elapsed, then the recording will stop. The telegrams received before this time can be saved and then played back later.

ℹ Due to the temporary saving of the telegram sequence, the saved data will be lost if the power supply fails or a commissioning operation is carried out. In this case, a new recording must be started after the device reset.

Each recorded telegram is issued with a time stamp, accurate to the second. The time stamp takes the current time and weekday into account when the telegram arrives. This information is obtained from the internal system clock of the device. Marking with a time stamp is important on playing back .

The operating and display element "Status" displays either the remaining time of the telegram recording or the number of received telegrams in the status text. By pressing the control and display surface, an additional page is displayed in which the time of the recording and number of received telegrams are indicated. The status text in the operating and display element can be adapted as required by pressing any of this display information.

The user can also stop a recording before the set recording period has elapsed. To do this, the "Record" button must be tapped during a recording process. The icon and status text of the operating and display element thus change the status and display a stopped recording process.

ℹ Each time a recording is started, the previous recording is deleted.

ℹ An active recording can be signalled to the bus via the 1-bit communication object "Recording active", which can be configured in the presence simulation parameter node in the configuration software.

ℹ The display page of the presence simulation does not have to be kept permanently displayed during active recording. The device can be operated as normal during this time.

Playing a telegram sequence back

After a simulation has been recorded successfully, the saved telegram sequence can be played back. Each telegram was issued with a time stamp on recording. The playback of the saved telegram sequence takes place accurate to the second.

A telegram sequence can be played back when the control surface (B) is pressed (11.). After that, 3 additional operating and display elements appear in the display (figure 102).

i The control surface (B) can first be operated when a telegram sequence has been recorded.

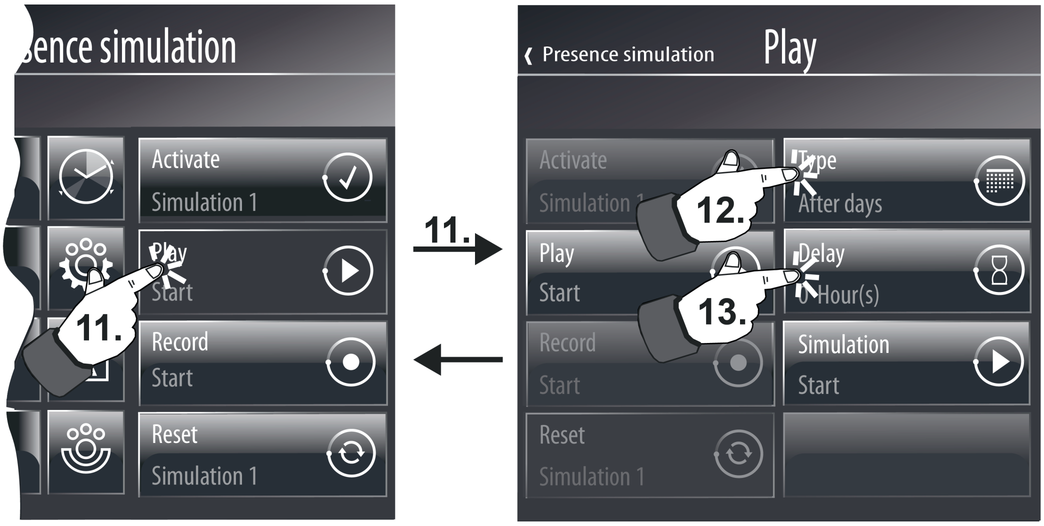


Figure 102: Example of a display page for setting the playback type and playback delay of a simulation (right)

Before the user starts playback, the type of playback must be specified. The type of playback is configured by tapping the control surface "Type" (12.) A distinction is to be made between two different cases when setting the type of playback, which are switched over each time the control surface is pressed...

- Type of playback "By time":
  When the telegram sequence is played back, only the time of the individual telegrams is taken into account. The weekday is ignored.
  The previously recorded telegram sequence is repeated cyclically until the playback is stopped.
- Type of playback "By days":
  When the telegram sequence is played back, in addition to the time, the weekday upon which the individual telegrams were recorded, is taken into account.
  In this case, the telegrams are played back by weekday. No telegram is played back on days why no telegram was recorded.
  Example 1: recording only took place on a Tuesday and was active for considerably less than 24 hours. On playing back, the simulation is only executed at the recorded times and only on a Tuesday. The simulation has no effect on other days.
  Example 2: recording was limited to 5 days and was started on a Wednesday. Telegrams were recorded on the Wednesday, not on Thursday and Friday (no telegram activity), and telegrams were received again during Saturday and Sunday. On playing back, the simulation is executed on the Wednesday, not on the Thursday and Friday, and then continues on the Saturday and Sunday.
  In every case, the recorded telegram sequence is repeated cyclically according to the weekdays until the playback is stopped.

The start of a playback of a telegram sequence can optionally be delayed for up to one day. To do this, a time in hours (0...24) must be specified by pressing the control surface "Delay" (13.) via the on-screen keyboard. The setting "0" deactivates the delay time. In this case, the playback starts immediately after the start command. The delay time only has an effect on the start time of the simulation (like delayed tapping of the "Simulation" control surface) but not on the saved time stamps of the telegrams.
The time of an elapsing delay is displayed in the status text of the control surface (B). This

allows the remaining time to be read clearly up until the actual starting process.
The delay time is advisable, for instance, if the start of the simulation should first occur when it can be assumed that no more persons are in the building (e.g. before a weekend or company holiday).

i Stopping a playback causes the delay time to stop. This is restarted completely once the start command is given again.

Playback of the presence simulation can be started by tapping the control surface "Simulation" (14.) (figure 103). The device then begins to play the telegram sequence back according to the saved time stamp and the configured playback type. If a delay time is set, the device waits until the time has elapsed before starting the playback.
Playback can be cancelled at any time by tapping the control surface "Simulation". In addition, playback of the presence simulation can be started and stopped using the "Start/stop playback" 1 bit communication object.

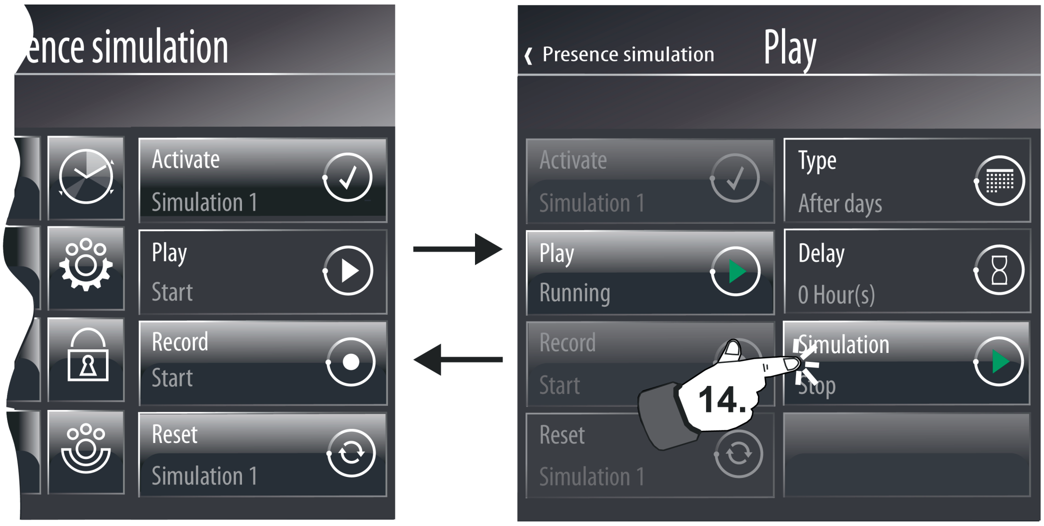


Figure 103: Example of a display page for starting and stopping a playback (right)

i The previously recorded telegrams of the simulation are worked through chronologically. The time of processing depends on the starting time of the simulation. If, for example, the recording period began at 8:00 but playback is not started until 9:00, then only those telegrams will be transmitted which were recorded at or after 9:00. Telegrams before this time are only taken into account in the next cycle (only time or time/weekday-dependent). During the playback of a recording period, the telegrams are only transmitted once within a cycle. If, during playback, the time of the device is put back, then previously transmitted telegrams of a cycle will not be transmitted anew. If the time is put forward, then the device detects which telegrams were skipped, and then transmits the telegrams in one go, thus synchronising the telegram sequence with the current time.
The same thing happens if, during the recording phase, the time was put back, for example on changing from summer to winter time. In this case, the panel checks during playback to see if the telegram following the current one is more recent in the recording. If this is not the case, due to the change in time in the recording, then the older telegrams are transmitted immediately until the time stamp matches again.

i Active playback can be signalled to the bus using the 1-bit communication object "Playback active", which can be configured in the presence simulation parameters in the configuration software.

i Simulation playback only ever takes place using the group addresses of the function objects to be sent.

ⓘ The display page of the presence simulation does not have to be kept displayed during active playback. The device can be operated as normal during this time.

Resetting simulation

An entire simulation can be reset if required. At the same time, all function assignments and the saved telegrams are deleted. The simulation is reset when the control surface (D) is pressed on the page of the presence simulation (figure 96).
A reset simulation can be reconfigured and recorded again at any time.

4.2.4.16 Signalling system

4.2.4.16.1 Introduction and basic principles

Introduction

The signalling system allows existing sensors of a KNX installation to be included in the project design of the device for monitoring a building or building section. The signalling system can display the status of window contacts, motion detectors or glass break sensors and monitors changes in the statuses of these detectors.
The detectors integrated in the signalling system can be combined into up to two security areas. Arming these areas allows monitoring of the secured area for break-ins when people are present in or absent from the building. In addition, sections of the area can be monitored for sabotage. If there is a break-in alarm, visual and acoustic alarms can be activated.

The signalling system can be controlled directly on the device using a separate system page. The system status (active detectors, events) and operation (arming/unarming, acknowledgement) is made simple and clear by predefined screen icons and pages. In addition, arming or unarming is possible using other bus subscribers - for example touch sensors or button interfaces and binary inputs with connected operating units. In addition, in the case of an alarm or fault, it is also possible to display system statuses or detector texts on other KNX display units - e.g. info displays or simple LED displays. The signalling system makes separate communication objects available for this.
It should be noted that a reset to readiness after an alarm or fault, or the viewing of the event memory is only possible on the device as a central component!

The signalling system is operated on a separate display page. The display page of the signalling system is opened via the function view in the main menu level (predefined display structure). To do this, press the tile with the 🚨 symbol (1.).

As soon as the display page of the signalling system is opened, 4 control surfaces that execute various functions appear in the display (figure 104).

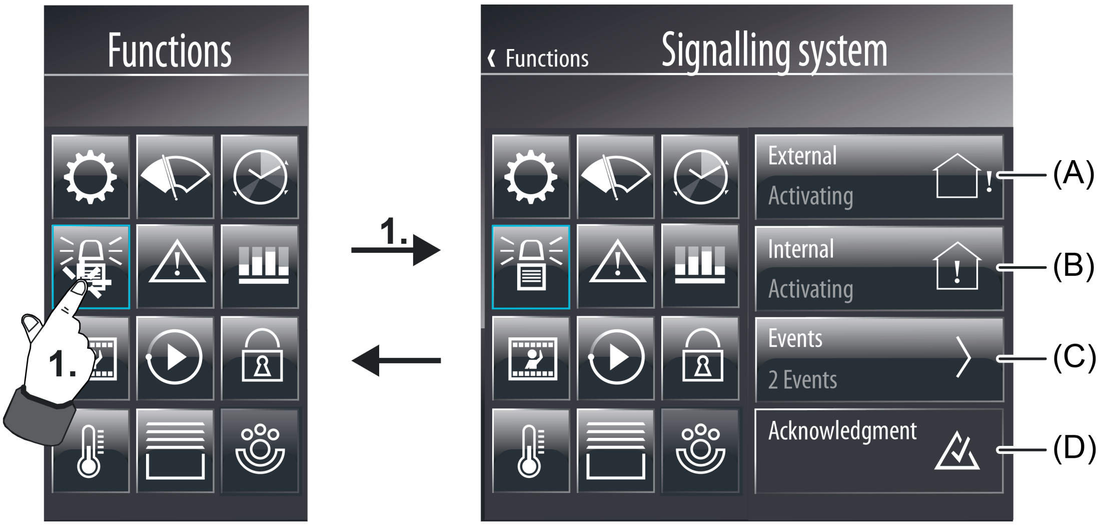


Figure 104: Example of a display page of the presence simulation in the function view

(A) Display and control surface for arming or unarming the "External" Arm area (can be hidden as required)

(B) Display and control surface for arming or unarming the "Internal" Arm area (can be hidden as required)

(C) Display and control surface for viewing of the event memory

(D) Display and control surface for acknowledgement

The display page of the signalling system can be hidden optionally from the function view. If this is desirable or necessary, the parameter "Function visible" must be deselected in the configuration software in the global settings of the signalling system. The signalling system is then no longer accessible via the predefined menu structures of the visualisation. It can then only be accessed by means of internal open pages and operated via the communication objects.

ℹ As a function component of the device, the signalling system is not a complete alarm system. For example, if the main or bus power supply fails, uninterrupted operation is not guaranteed. In addition, no signal encoders or transmission devices can be directly connected to the system, meaning that there is no opportunity to monitor these elements. The device's signalling system is also not VDS-certified.
If such functions or characteristics are required, a suitable KNX alarm centre must serve as a replacement.

ℹ The display page of the signalling system can be protected from access by unauthorised persons by means of its own password. If this is desired, the password protection of the display page must be activated in the configuration software.

Security areas and configuration

A security area is an area of the signalling system, which secure specific building sections such as individual rooms, building wings or facade areas and monitors them for break-ins. In the security areas, detectors are those components which allow such monitoring. These detectors could be magnetic contacts on windows or doors, motion detectors on walls or ceilings in interiors as well as glass break sensors. Detectors can be connected to the KNX via suitable components (button interfaces, binary inputs, etc.) or, depending on the device version, be connected to the KNX directly.
Security areas can be activated and deactivated, i.e. armed and unarmed. Arming and unarming takes places either directly on the device or using the external KNX switching units.

ℹ External switching units are components such as keyswitches, transponder units, code keypads or block locks. In many cases, such units are intended for use in alarm or signalling systems and, for this reason, can monitor for sabotage. Simple installation buttons or KNX push button sensors can also easily be used as switching units. However, these do not provide any protection against unauthorised sabotage access. For this reason, button sensors are often attached within a building to be protected, for example to activate the external skin monitoring ("internal arming").
External switching units can be coupled to the device's signalling system using separate 1-bit objects. The sabotage contacts of the switching unit can be included using the "Sabotage" detector input (see page 214).

The signalling system makes a distinction between security areas, the interior and the external skin. This distinction allows separate monitoring and arming of different building sections depending on whether authorised people are in them or not. During the project design of the signalling system in the configuration software, created detectors are assigned to the security areas.

"External skin" security area:
The external skin separates the indoor area of a object to be secured, from the external area. Detectors integrated in the external skin can, for example, detect unauthorised access or sabotage to the house or garden door, to the building windows and to the garage door. In these cases, suitable detectors are often magnetic contacts or glass break sensors.
The external skin can be armed separately. Arming usually take place using a switching unit located within the building (e.g. control surface on the device, button sensor). In this case, there are authorised people in the building. Only monitoring of the external skin takes place. Only the internal siren is activated when there is an alarm. This status is called "internally armed".

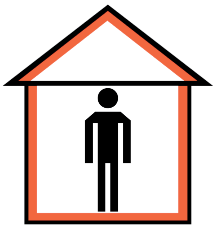


Figure 105: External skin as signalling area - "internally armed"

"Interior" security area:
Detectors are assigned to the interior of a building to be secured which can protect the interior area, i.e. the lived in spacers of a building, against break-ins and sabotage. Suitable detectors would be magnetic contacts on internal doors or motion detectors on walls or ceilings.
The interior is always armed and monitored together with the external skin. Arming often take place using a switching unit, for example located on the outside, next to the entrance door. This switching unit can also be located within a building, however, (e.g. control surface on the device, button sensor) and can arm the security areas in conjunction with an arming delay (see page 218-219). When armed, no authorised people are in the building. There is then external skin and interior monitoring. The internal siren and the visual alarm are activated when there is an alarm. This status is called "externally armed".

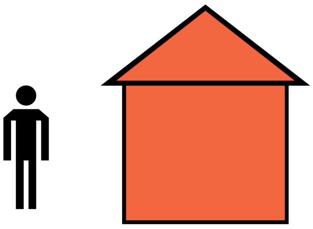


Figure 106: Interior with external skin as signalling area - "externally armed"

System statuses

The signalling system reacts differently to incoming signals or commands, depending on the whether the security areas are armed or unarmed. The signalling system distinguishes between up to five statuses .

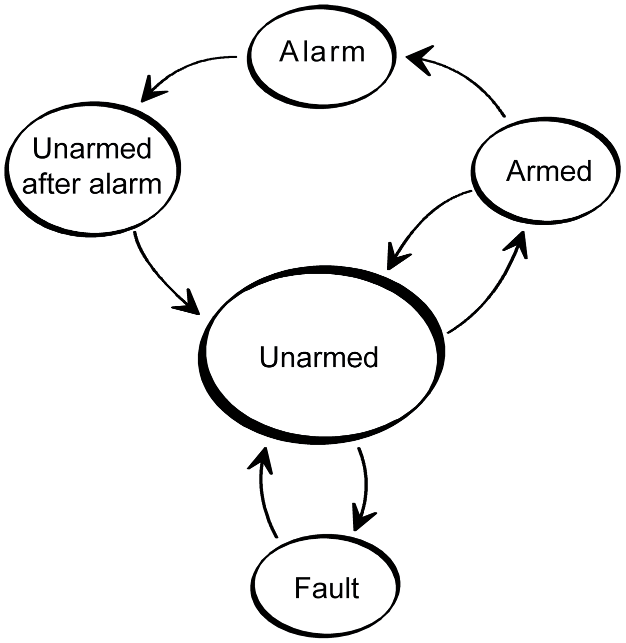


Figure 107: System statuses of the signalling system

A distinction is made between the following system statuses...

- "Unarmed" status:
  If both security areas are unarmed, break-in messages in these areas (e.g. a window is opened), or a a sabotage messages do not lead to an alarm. Active detectors are then only displayed in the detector list. The system can only be armed from the "Unarmed" status, when the appropriate security areas are ready for arming. The status display of a security area on the display page of the signalling system displays "Arm" when detectors in the appropriate area are inactive. If detectors are active, then the status displays "not ready".
  In the "Unarmed" status, sabotage signals (active sabotage input) will lead to a fault, which is signalled via the appropriate communication object or directly on the device (cf. "Fault" status). The "Unarmed" status can be signalled using the "Arming message, internal" or "Arming message, external" and "Unarming acknowledgement" objects on the bus.

- "Armed" status:
  A security area can only be armed when all the detectors assigned to this area are inactive and there is no fault. In this case, the "Arm" status is displayed on the display page of the signalling system.
  In addition, this status can be signalled on the bus for each security area using the "Ready to arm ..." status ("0" = Not ready to arm / "1" = Ready to arm).
  If security areas are armed, break-in messages in these areas will trigger an alarm. A distinction is made between...

  "Internally armed": only the external skin of a building is monitored. Authorised people are located in the interior of the building. No alarm is triggered unless the external skin is infringed. Motion detectors installed in the interior detect movements but no alarm is triggered. A sabotage signal will immediately trigger alarm in the "internally armed" status.

  "Externally armed": all the internal and external detectors, i.e. both security areas, are monitored. An alarm is triggered when any detector responds (also the sabotage detector).

  Should an area not be ready for arming, the status indication of a security area displays "Not ready" and the value of the "Ready to arm" object is "0". Before arming in this case, the cause (e.g. an open window) must be detected and eliminated. The detector list can help here, as it displays all the active detectors.
  It is possible to configure an arming delay time in the configuration software for both internal and external arming. For example, the delay time is necessary when a switching unit (e.g. keyswitch) is located within an areas to be monitored and the area is evacuated before arming. The same applies when the system is armed externally on the device. The delay time specifies after what time the system is actually armed after an arming command. When setting the time, a time reserve should be planned, so that the user is still able to leave the building to be secured correctly before actual arming. Only when the delay time has elapsed should there me no detectors active, as otherwise arming will not take place.
- "Alarm" status:
  If a detector within an armed area responds, the signalling system switches to the "Alarm" status and activates the internal siren and, with additional external arming, also the visual alarm.
  If an additional detector triggers after a prior alarm, then a subsequent alarm is activated. In so doing, the internal configured siren is again triggered and, if necessary, switched on again.
  An alarm can only be deactivated by unarming using the switching devices or deactivated directly on the device using the appropriate control surface.
  If an alarm delay time was configured in the configuration software, a "Prealarm" can be activated first. A prealarm can be signalled by the piezo buzzer of the device and/or by a separate communication object. The system can be unarmed during a prealarm, without triggering an alarm. The transition to "Alarm" status then takes place without unarming only when the appropriate alarm delay time has elapsed, which can be configured separately for internal and external arming. A subsequent alarm is always activated without delay.
- Status "Unarmed after alarm"
  After an alarm was reset through unarming (internal siren deactivated, visual alarm still activated), the system switches to the status "Unarmed after alarm". After an alarm, the cause of the alarm must always be determined. In this status, the triggered detectors of the security area affected by the alarm are displayed in the event memory of the device (see page 225). In so doing, all the events are logged between system arming and unarming. In the "Unarmed after alarm" status, there must first be an acknowledgement using the control surface of the same name on the device in order to return to the "Unarmed" status. The system can only be rearmed when all the previously tripped detectors of the affected security areas were reset.

- "Fault" status:
  The system switches to the "Fault" status when the sabotage detector has tripped or if, during detector monitoring, at least one missing detector was detected. A fault restricts the function of the signalling system to such an extent that proper operation can no longer be guaranteed.
  If a fault results from the "Unarmed" status, then the system cannot be rearmed (status display on the device "Not ready"). In this case, the fault must be detected using the detector list and eliminated through acknowledgement (see page 224).
  In the armed status, sabotage or a missing detector will immediately trigger an alarm. In this case, the system will only switch to the "Fault" status, after the alarm was acknowledged.
  A fault message can be signalled to the bus using the "Fault" object.

4.2.4.16.2 Detector

Detector types

The detectors of the signalling system are components that communicate via the KNX, which monitor a part of a building and signal a break-in or attempted break-in on the device. Commonly used detector types supported by the panel include magnetic contacts, glass break detectors and motion detectors. Special detectors can also be sabotage detectors, allowing sabotage or fault contacts of alarm encoders or switching devices (e.g. keyswitches) to be integrated in the signalling system. Also, lock monitors, such as bolt switch contacts, are detectors permitting a positive drive. This means that, for example, an area can only be armed when the front door is closed, i.e. the bolt switch contact is not active.

A triggered detector allocated to a security area is immediately evaluated in the signalling system and, when armed, immediately leads to an alarm. When armed, all the detectors of a security area are evaluated after a delay after triggering, if an alarm delay time was configured (see page 221). When the system is unarmed, triggered detectors - such as an open window - prevent active arming of the affected detector areas.
When the system is unarmed, a triggered sabotage detector causes a fault display and thus prevent arming of the system. When armed, an active sabotage detector immediately triggers a sabotage alarm.

The detector type (contact, movement, glass break) is defined for detectors of a security area and configured separately in the configuration software for each detector (see next section). The type "sabotage detector" is specified automatically by the use of a separate communication object, independently of the security areas.

Creating detectors and detector communication

During project design of the signalling system, detectors are added in the form of detector inputs in the configuration software "Interior security area" or "External skin security area". A total of 40 detectors can be allocated to each of the two security areas in this way.
Each newly created detector can be assigned a detector text, which then clearly identifies the detector. This text should be a maximum of 14 characters long (e.g. "Kitchen window", "Garage door") and later, during system operation, if there is activity on the part of the detector, an alarm or a fault, is either displayed in the detector list on the device screen or in the event memory. Optionally, if there is an alarm, the detector text can be transmitted to the bus using separate 14 byte communication objects.

The detector type of a detector (contact, movement, glass break) is specified by the parameter of the same name of the detector input. The configured type only specifies the text display and the symbol in the detector list (see next section) and has no further effect on the behaviour of a detector.

Each detector input has its own 1 bit communication object. The detectors are normally connected to the bus using suitable KNX components (such as binary inputs, button interfaces, etc.) and are thus connected to the detector system. The connection is made between the detector object of the device and the object of the bus device to which the detector is connected with one group address each. For reasons of clarity and detector monitoring, only one single detector may be connected to each detector object of the device (Detector -> Detector text -> Security area).

In the configuration software, each detector input can be configured to different telegram polarities, i.e. individual detectors can be active with a "1" telegram or a "0" telegram. The polarities configured in the signalling system must agree the edge parameters of the other bus subscribers. The following table clarifies the relationship between telegram polarity and edge evaluation in the bus device of the detector.

Detector contact type / Status	Edge reaction in the detector bus device	Tele-gram value	Parameter in the signalling system	Detector triggers
NO contact / not actuated	Rising = ON	1	Active on 0	no

NC contact / Actuated	Falling = OFF	0	Active on 0	yes
NO contact / not actuated	Rising = OFF	0	Active on 1	no
NC contact / Actuated	Falling = ON	1	Active on 1	yes
NO contact / Not actuated	Falling = OFF	0	Active on 1	no
NO contact / Actuated	Rising = ON	1	Active on 1	yes
NO contact / Not actuated	Falling = ON	1	Active on 0	no
NO contact / Actuated	Rising = OFF	0	Active on 0	yes

Edge evaluation and telegram polarity of a detector telegram

Example: with the setting "Input active on 1" in the detector system, a glass break sensor may only trigger when there is a glass break and, in this case, the binary input, to which the glass break sensor is connected, transmits a "1" telegram to the bus.

The sabotage detector must not be created specially. The sabotage input is created independently of the security areas in the view of the communication objects of the signalling system as standard and can be connected to a group address. A fault triggered by a sabotage input has a global effect on all the areas of the signalling system and requires special acknowledgement (see page 224). In addition, the telegram polarity of the sabotage detector input is permanently predefined and cannot be set. The sabotage input of the signalling system triggers when a "1" telegram is received via the "Sabotage" object.

Detector list

All the active detectors are displayed in the detector list (figure 108). The detector list is available separately for the internal and external Arm areas and is recalled when the control surfaces of these areas are pressed (2.). This allows easy detection of which detectors are preventing system arming, for example. In addition, it is easy to see at any time which windows and doors are open in the building.
In addition, missing detectors and a triggered sabotage detector are entered in the detector list, allowing identification of the cause of a fault.

To return to the display page of the signalling system, press the control surface "⟨" (supplemented by the name of the page) (3.) in the status line.

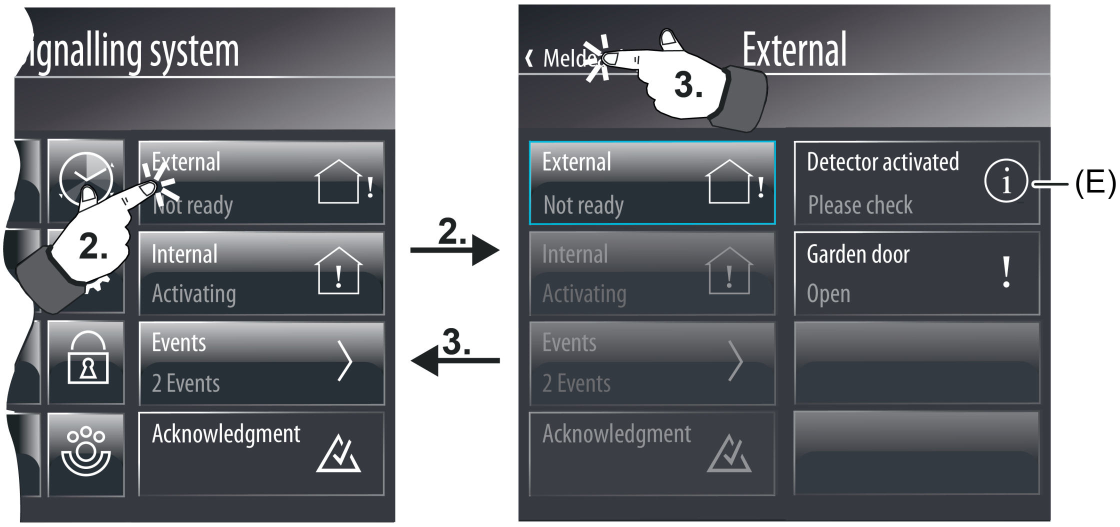


Figure 108: Example of a detector list

(E) Entry in the detector list

The following events are shown summarised in the detector list...

- all active detectors of the respective security area
  (Entry "<Detector name> + <Identification of the detector type>"
  Example: "Garden door open", "Glass break, kitchen window", "Movement in corridor"),
- An active sabotage detector ("Sabotage" entry),
- All the missing detectors (Entry "<Detector name> + <Text, detector missing>"
  Example: "front door detector missing").

ⓘ An entry only remains visible in the detector list until the appropriate detector is inactive again or has been detected as present.

ⓘ The control surfaces of the internal and external Arm areas can be hidden by a parameter setting in the configuration software if required. In this case, the detector list of the corresponding area is not available either.

Detector monitoring

Within a configurable monitoring period, the signalling system checks that the detectors created in the security areas exist, i.e. whether they are still connected to the KNX and are functioning. For this purpose, the device sends a read telegram cyclically to the bus subscriber to be tested via the group address connected to the detector input, e.g. to the transmitting object of a binary input. This bus subscriber must then send a response telegram back immediately to the signalling system. This response must have reached the device within a timeframe of 2 seconds.
Should a contacted detector not respond or respond after a delay, then the signalling system will check the appropriate detector a second and - if again no response is received - a third time within a short period. If, after the third query, the detector has still not responded, a fault (in the "Unarmed" status) or in alarm (in the "Armed" status) is triggered without further delay, depending on the system status.
If a missing detector causes an alarm, additional missing detectors can trigger subsequent alarms.

Each detector of a security area created in the configuration software is monitored in the manner described. The "Detector poll interval", which can be set in the parameters of the signalling system, defines the time between two read telegrams, i.e. the time between two detector tests. The signalling system polls all the created detector inputs in turn in this way. Example: poll interval: 10 s, 40 detectors have been created. -> A detector is polled every 10 s. After approx. 400 s, all the detectors have been tested. After this, the cycle test is continued again with the first detector.

The signalling system tests detectors considered missing cyclically at brief intervals, in order to be able to detect quickly whether or not the detector has reconnected. This is important for resetting a fault.

ℹ Detector monitoring does not take the sabotage input into account or the inputs for arming/unarming the security areas.

ℹ After switching on the power supply of the device, or after a commissioning operation, the signalling system quickly tests all the created detectors during device initialisation for their existence and, during the responses, evaluates the transmitted detector statuses (active / inactive). To avoid faults in the signalling system, all the detectors should already have been commissioned properly and be functional during device commissioning.
In addition, the detector poll may cause a delay of maximum 40 s before the signalling system is ready for arming after a device reset (precondition: all the detectors are inactive).

ℹ Care should always be taken to ensure that each detector input created in the configuration software is also linked to a group address and that there is a communication partner in the bus. For detector monitoring to function, the "Read" flags must be set on the objects to be transmitted by the bus devices of the detectors.
For each detector to be monitored, it is also important that the group addresses of the detectors to be transmitted are clear, i.e. are not connected to any other transmitting bus subscriber. Each messages must have an independent connection to its own detector input on the signalling system. Only then can it be ensured that only the contacted detector responds and that detector monitoring is clear.

4.2.4.16.3 Arming

Arming/unarming the security areas

The signalling system makes a distinction between security areas, the interior and the external skin. This distinction allows separate monitoring and arming of different building sections depending on whether authorised people are in them or not. For this reason, the device allows internal and external arming (see page 208-209).
A security area can only be armed when all the detectors assigned to this area are inactive and there is no fault in the system.

Arming and unarming takes place either directly on the device or using KNX switching units, such as push-button sensors or push-button interfaces or key switches connected to binary inputs. There are also two separate 1 bit communication objects available for arming the bus, one for internal arming and one for external arming. The telegram polarity of these objects is fixed: "1" = Arm / "0" = Unarm.
Arming on the device is possible on the display page of the detector list using the "External" or "Internal" control surfaces, but only if the Arm areas are also ready for arming. Unarming takes place via the same control surfaces. The device automatically switches the function (Arm / Unarm) according to the current system status. Local arming using the control surfaces can be prevented in the parameter configuration of the configuration software by hiding the control surfaces.

Arming without arming delay:
The area to be armed must be ready for arming. On internal arming, the signalling system only tests the external skin whilst on external arming, both the internal skin and the interior are tested for arming readiness. The detector list helps the system operator to detect active detectors which prevent arming readiness.
Pressing the Arm control surface on the device or sending a "1" telegram to the "Internally armed" or "Externally armed" object causes the system to switch to the "Armed" status immediately.

Arming with an arming delay:
Arming with an arming delay is often used when the switching device
(e.g. the device or a button sensor) is installed in the secure area of the building. In this case, the system operator must be able to arm the system and still be able to leave the building in time. The arming delay can be configured separately, using the parameter of the same name in the configuration software, for internal and external arming. Delay times of 0 to 255 s can be configured. The setting "0 s" (presetting) deactivates the arming delay for the appropriate arming operation. When setting the time, a time reserve should be planned, so that the user is still able to leave the building to be secured correctly before actual arming.
The delay time specifies after what time the system is actually armed after an arming command (turning of the keyswitch or pressing of the Arm area on the device). In so doing the signalling system only checks the arming readiness of the security areas after the delay time has elapsed.

Example: the system is to be armed externally on the device. For external arming, the system operator must leave the building. The front door is still open. Therefore, the device displays "not ready". The operator can still carry out the arming command on the device. The signalling system starts the arming delay. Within this time, the owner leaves the building and locks the front door. This makes the system ready for arming (no more detectors are active). When the delay time has elapsed, the signalling system checks for the arming readiness system status. If it is ready, the system arms immediately.

Should, however, a detector still be active after the arming delay has elapsed, (e.g. front door not closed or window opened), then arming does not take place! Here too, the detector list helps the system operator to detect active detectors which prevent arming readiness before setting the arming command. If the system does not arm after the delay time has elapsed, then no acknowledgement will take place either (see next section).

ⓘ An elapsing arming delay can be cancelled at any time by unarming.

Unarming:
In the "Armed" status, the system can be unarmed at any time. To do this, either the "Unarm" button must be pressed on the device or a switching device must be set to "Unarmed". The system then switches to the "Unarmed" status immediately.
If an alarm has occurred, then an Unarm command will reset the alarm (deactivation of the internal siren) and switch to the "Unarmed after alarm" status. If there is an alarm delay, then unarming within the elapsing delay time (prealarm) will prevent a alarm from being triggered (see page 221).

ⓘ The following always applies: if there is internal arming or an internal arming delay is elapsing, then external arming is not possible. Internal unarming must take place and then, if the system is ready to arm, external arming is possible. The reverse is true in like manner.

ⓘ The signalling system only reacts to an arming or unarming command, when a system status change is possible (Unarmed -> Armed / Armed -> Unarmed / Alarm -> Unarmed after alarm). Repeating telegrams (Armed -> Armed / Unarmed -> Unarmed - e.g. for KNX switching units with cyclic transmission) are ignored by the signalling system.

ⓘ Arming or unarming is saved in the event memory along with the date and time (if necessary, only after the arming delay has elapsed) (see page 225).

Signalling during arming/unarming

In the case of external arming, the signalling system can confirm its status change "Unarmed" to "Armed" via the visual signal encoder output ("acknowledge"). This means that it is possible to detect clearly whether the system has responded to an arm command as required or not. This is particularly important when the system is operated remotely - without seeing the device- or in the case of an arming delay. The visual signal encoder will not give a special acknowledgement on unarming. The signal encoder is also not controlled for internal arming.
Whether the visual signal encoder is controlled in the case of external arming can be set in the configuration software using the parameter "Visual acknowledgement on external arming" in the parameters of the signalling system. This means that it is possible to switch visual feedback off.

In addition, various signals are available to signal the status of the signalling system. These signals are 'run out' using separate KNX 1-bit objects and can be tapped.

The following objects can be configured in the parameters of the signalling system in the configuration software...

- "Ready to arm, internal" and "Ready to arm, external":
  These objects signal the readiness of the assigned security areas separately for internal or external arming. If the areas are ready for arming, the object value is "1". If they are not ready, the object value is "0".
  When the system is armed (no matter whether internally or externally), both objects switch back to "0", irrespective of which status is displayed on the page of the signalling system on the device.
- "Arming message, internal" and "Arming message, external":
  These objects signal whether the appropriate security areas are armed or unarmed separately for internal or external arming. Signalling is static for the length of the status. An object value "1" means "Area(s) armed", whilst an object value "0" means "Area(s) unarmed". "Unarmed" is signalled in the system status "Unarmed after alarm".

- "Arming acknowledgement":
  This object dynamically signals successful internal or external arming for the length of the "Arming acknowledgement time" set in the configuration software. No distinction is made between the security areas. The object value switches to "1" as soon as the system has armed. The object value returns to "0" automatically when the arming acknowledgement has elapsed. It is possible to cancel arming acknowledgement by unarming before the arming acknowledgement time has elapsed.
- "Unarming acknowledgement":
  This object dynamically signals successful internal or external unarming for the length of the "Unarming acknowledgement time" set in the configuration software. No distinction is made between the security areas. The object value becomes "1" as soon as the system has unarmed (status change "Armed -> Unarmed" or "Alarm -> Unarmed after alarm"). When the status changes from "Unarmed after alarm -> Unarmed", there is no unarming acknowledgement. The object value returns to "0" automatically when the unarming acknowledgement has elapsed. It is possible to cancel unarming acknowledgement by arming before the unarming acknowledgement time has elapsed.

ℹ If, after an arming command (or after an arming delay has elapsed), the signalling system does not arm, because the affected security areas are not ready to arm, there will be no acknowledgement. In this case, the dynamic object "Arming acknowledgement" and, in the case of external arming, the visual signal encoder are not controlled (no negative acknowledgement).

ℹ To be able to distinguish between dynamic objects for arming and unarming, the acknowledgement times for "Arming" and "Unarming" should be of different lengths. When arming or unarming is repeated ("Armed" -> "Armed", "Unarmed" -> "Unarmed"), there is no retriggering of the dynamic signalling. This is only transmitted once on changing status.

4.2.4.16.4 Alarms

Activating and deactivating an alarm

If a detector within an armed area responds, or a sabotage detector triggers when armed or any detector is found to be missing, the signalling system switches to the "Alarm" status and activates the internal siren and, with additional external arming, also the visual alarm. For this, "1" telegrams are transmitted to the bus using the corresponding 1 bit communication objects. In addition, the device transmits a "1" telegram via the "Alarm" object. This allows any switching function to be executed in the bus. In addition, the signalling system uses the 14 byte object "Alarm detector text" to display the detector text of the detector which triggered the alarm.

The internal siren is an alarm encoder activated for a set period of time. The system project planner must set the switching length of the internal siren in the configuration software. Switching times of 2 to 255 s are configurable. The signalling system automatically deactivates the internal siren when the switching time after the alarm is triggered has elapsed. The visual alarm (e.g. a flashing light on the exterior of the building) remains activated for the entire length of the alarm status (see "Alarm acknowledgement" section below).
An alarm and the detector that causes the alarm are logged in the event memory of the device (see page 225).

An active alarm can be switched off by unarming on the device or on a KNX switching unit. In this case, the device switches the internal siren off if it has not already been switched off automatically after a period of time has elapsed, transmits a "0" telegram to the bus via the "Alarm" object and switches to the status "Unarmed after alarm". The visual alarm (for external alarming) still remains switched on.

ℹ In the case of an alarm, the device can also send an e-mail with a predefined text, providing that the Ethernet functionality of the device is used and an e-mail account was configured. For this purpose, the "Alarm" object of the signalling system can be linked to the object of an event e-mail of the device using an internal or external group address.

In the case of an alarm, the symbol 🚨 (F) is displayed in the footer of the screen (figure 109). This symbol will also remain visible even if an alarm - e.g. by a switching device - was disabled and the system is in the status "Unarmed after alarm". This makes it possible for persons to easily recognise on the device that an alarm is or was present irrespective of the visible display page. By pressing the symbol in the footer, the on-screen display branches to the display page of the signalling system where the event memory can be viewed and the alarm acknowledged. The symbol in the footer goes out after successful acknowledgement of an alarm.

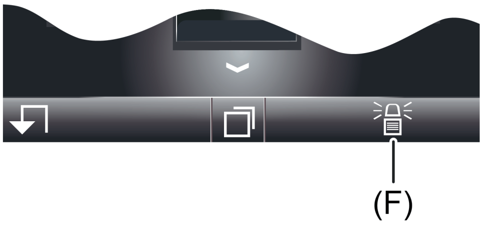


Figure 109: Symbol in the footer of the screen for displaying an alarm

(F) Display and control surface in the footer (unacknowledged alarm)

Alarm delay / Prealarm

An alarm delay can optionally be configured for the internal and external arming. An alarm delay is often used when the switching device (e.g. the device or a button sensor) is installed in the secure area of the building. In such cases, authorised people must be able to enter the secured building area, meaning the status the switching device for unarming can only be reached after a

delay.
The alarm delay can be configured separately for internal and external arming using the parameter of the same name in the configuration software. Delay times of 0 to 255 s can be configured. The setting "0 s" (presetting) deactivates the alarm delay for the appropriate arming operation.

If an alarm delay time is running during system operation, a "Prealarm" can be activated first. Depending on the parameter configuration, a prealarm is signalled by the piezo buzzer of the device and/or separate 1-bit communication objects. During a prealarm, an authorised person can unarm the system without triggering a "real" alarm. The transition to the "Alarm" status only takes place is the system is not unarmed during the prealarm.

ℹ A prealarm configured in the configuration software only functions if an alarm delay time of more than 0 s has been configured. Otherwise the prealarm will not be executed during system operation.

ℹ An alarm due to a triggered sabotage detector or a missing detector is always executed without delay.

Subsequent alarm

If an additional detector of an armed security area triggers after a prior alarm, then a subsequent alarm is activated. In so doing, the internal configured siren is again triggered and, if necessary, switched on again. A detector which previously triggered an alarm cannot trigger a second subsequent alarm.
A subsequent alarm is always activated without delay, even with a planned alarm delay.
A subsequent alarm and the detector causing it are logged in the event memory of the device (see page 225). In addition, the signalling system uses the 14-byte object "Alarm detector text" to display the detector text configured in the configuration software of the detector which triggered the alarm.

Alarm acknowledgement / "Unarmed after alarm"

Each alarm must be acknowledged directly on the device. Without alarm acknowledgement, it is not possible to switch to "Unarmed" status and thus additional arming. The system operator can acknowledge an alarm in the status "Unarmed after alarm".

Primarily, there are two methods of acknowledging an alarm...

- Separate unarming + acknowledgement:
  An active alarm (internal siren + "Alarm" object switched on) can - as described above - be deactivated by unarming. The system switches the internal siren off if it has not already been switched off automatically, transmits a "0" telegram to the bus via the "Alarm" object and an unarmed acknowledgement to the bus and switches to the status "Unarmed after alarm". The visual alarm (for external alarming) remains switched on.
  In the "Unarmed after alarm" status, the operator can the inspect the event memory directly on the device to see which detector triggered the alarm at which time. The alarm can usually then be confirmed by pressing the "Acknowledge" control surface on the device and then reset completely. The system then switches the visual signal off (for external alarms) and then switches to the "Unarmed" status. In this case, there is no additional unarming acknowledgement. The device transmits the text "No alarm" to the bus via the 14 byte object "Alarm detector text".
  In the "Unarmed after alarm" status, the piezo buzzer of the device is controlled in order to alert the user to go to the device and acknowledge the alarm.

- Unarming by acknowledgement:
  An alarm can also be acknowledged directly without separate unarming and thus reset. Such behaviour is advisable, for example, when the internal siren set for a specific time after an alarm has already turned "quiet", i.e. need not be turned off, or the system is operated directly on the device. For this purpose, the "Acknowledge" button can be pressed on the signalling page of the device in the "Alarm" status.
  With such operation, the signalling system completely deactivates the alarm and acknowledges it at the same time. Deactivating the alarm switches off the visual alarm (for external alarms) and the internal siren, if this has not already been switched off automatically. In addition, the system transmits a "0" telegram via the "Alarm" object and the text "No alarm" to the bus via the 14 byte object "Alarm detector text". The system then immediately switches to the status "Unarmed" without any separate unarming acknowledgement. This type of operation does not set the status "Unarmed after alarm".
  Before or after the "Acknowledge" control surface is pressed, the system operator can inspect the event memory directly on the panel to see which detector triggered the alarm at which time.

ℹ After an alarm has been acknowledged, the system automatically switches to the "Fault" status, if, for example, the sabotage input was the detector triggering the alarm. This subsequent fault must then be acknowledged separately on the device. The cause of the fault must have been eliminated for a fault message to be acknowledged (see page 224).

4.2.4.16.5 Fault

Cause of fault and fault behaviour

The signalling system switches to the "Fault" status when the sabotage detector has tripped in unarmed or if, during detector monitoring while unarmed, at least one missing detector was detected. If the system is armed, then these events will lead to an immediate alarm. In this case, the system will switch to the "Fault" status, when the alarm has been acknowledged.
A fault restricts the function of the signalling system to such an extent that proper operation can no longer be guaranteed. A fault causes the system to no longer be armed for as long as the fault has not been eliminated. The detector list and the event memory can be used to detect the cause of the fault and the time the fault was activated.

If there is a system fault, the device transmits a "1" telegram via the "Fault" object. This allows any switching function to be executed in the bus along with other signalling operations, e.g. using a transmission device. An e-mail, predefined in the device, can also be set by linking this object with an e-mail event.

If the fault was triggered by a missing detector, the signalling system uses the 14 byte object "Fault detector text" to display the detector text of the faulty detector. If several detectors are missing, then the detector text of the detector is transmitted which was most recently detected as missing.
If the fault was triggered by the sabotage detector, then the test "Sabotage" is transmitted to the bus via the 14 byte object.

The fault status continues to remain active, even if the cause of the fault has already been eliminated. The status is first reset after the system operator has acknowledged the fault directly on the device.

Acknowledgement of a fault message

A fault must always be acknowledged directly on the device. Without a fault acknowledgement, it is not possible to switch back to "Unarmed" status and thus additional arming. The cause of the fault must have been eliminated in order to be able to acknowledge a fault. This means that the sabotage detector may ot be active before acknowledgement, ad all the detectors of the security areas must have been detected as existing. The detector list can be used to detect which detectors may be preventing the acknowledgement of a fault.
After the operator has acknowledged a fault, the device uses the "Fault" object to transmit a "0" telegram and, via the 14 byte object "Fault detector text", the text "No fault" to the bus. After this, the signalling is system is ready for operation again.

ℹ After an alarm has been acknowledged, the system automatically switches to the "Fault" status, if, for example, the sabotage input was the detector triggering the alarm. This subsequent fault must then be acknowledged separately on the device in the manner described.

4.2.4.16.6 Event memory

The signalling system has a non-volatile event memory in which specific fault messages and all the events in armed security areas can be recorded (figure 110). The event memory is recalled by pressing the "Events" control surfaces (4.).

To return to the display page of the signalling system, press the control surface "‹" (supplemented by the name of the page) (5.) in the status line.

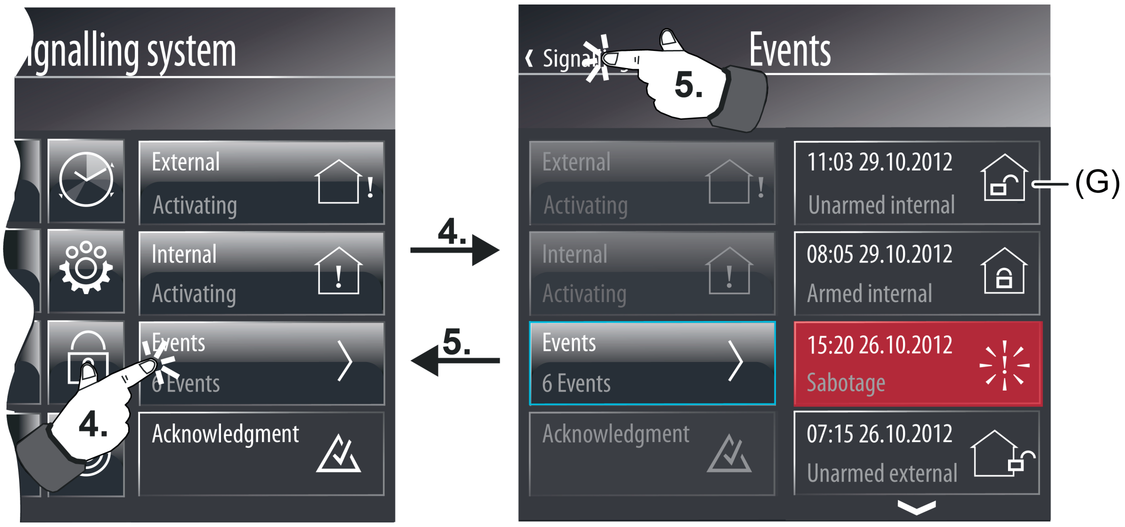

gnalling system
External
Activating
Internal
Activating
Events
6 Events
Acknowledgment
4.
5.
‹ Signa
Events
11:03 29.10.2012
Unarmed internal
08:05 29.10.2012
Armed internal
15:20 26.10.2012
Sabotage
07:15 26.10.2012
Unarmed external
(G)

Figure 110: Example of a display in the event memory

(G) Entry in the event memory with time and date stamps

The following events and fault messages are given time and date stamps and are logged in the event memory...

- "Arming, internal" (internal arming),
- "Arming, external" (external arming),
- "Unarming, internal" (internal unarming),
- "Unarming, external" (external unarming),
- "Alarm" (also subsequent alarms),
- "Detector activated: <Detector text>" (Detector which caused the alarm or subsequent alarm),
- "Alarm reset" (acknowledgement of an alarm),
- "Sabotage" or "Detector missing: <Detector text>" (cause of the fault),
- "Acknowledgement" (fault acknowledgement),
- Reset" (return of power supply, commissioning operation).

ℹ Active detectors are not recorded in the event memory in the "Unarmed" status.

Events are stored in the RAM of the device. Previous events will be lost in the case of a mains voltage failure. The size of the event memory depends on the device's available memory resources for the KNX application.

4.2.4.16.7 Response to a device reset

After switching on the mains power supply of the device or after a commissioning operation, the signalling system always switches to the "Unarmed" status. Then the signalling system quickly tests all the created detectors of the security areas for their existence and ability to transmit and, during the responses, evaluates the transmitted detector statuses (active / inactive). This checks the security areas for their readiness to arm. During initialisation, the detector poll may cause a delay before the signalling system is ready for arming after a device reset (precondition: all the detectors are inactive). Should an active sabotage detector or a missing detector be detected, then the system switches to the "Fault" status.

Immediately after a reset, the signalling system generates a defined object status by setting all the KNX communication objects to values that correspond to the set system status. The system also transmits telegrams.

ℹ The device, and thus also the signalling system, switches off when the mains power supply fails. If the mains or bus power supply fails, uninterrupted operation is not guaranteed. Detector status, alarm and fault signals are not saved when the bus or mains power supply fail.

4.2.4.17 Web browser

The device has a simple web browser that is integrated in the KNX application. In this way, a web page from the local network or from the Internet - e.g. for advertising purposes - can be displayed without direct access to the Windows® operating system. To enable this, the device must integrated in a local network via the Ethernet interface and the IP communication parameters must be set correctly in the Windows® operating system.

The web browser is operated on a separate display page. The display page of the web browser is opened via the function view in the main menu level (predefined display structure). To do this, press the tile with the 🌐 symbol (1.).

As soon as the display page of the web browser is opened, the start page defined in the configuration software appears in the display (figure 111).

The web browser can be exited by pressing the control surface "‹ Exit browser" (2.). The display will then return to the page from where the browser was recalled.

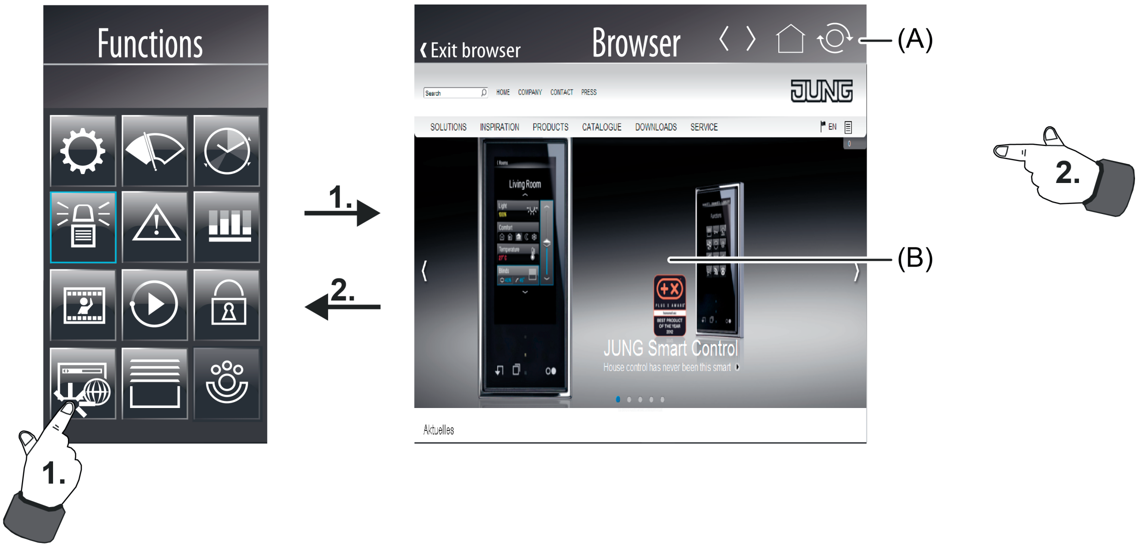

Functions
1.
2.
‹ Exit browser
Browser
(A)
HOME COMPANY CONTACT PRESS
SOLUTIONS INSPIRATION PRODUCTS CATALOGUE DOWNLOADS SERVICE
(B)
JUNG Smart Control
House control has never been this smart
Aktuelles
2.
1.

Figure 111: Example of a web browser display page

(A) Navigation bar with operating elements for navigation and updating of pages

(B) Browser window (display and operating area for links from web pages)

The device displays the received web page in full format in the browser window (B). If the web page is larger than the browser window, the web contents can be shifted horizontally and vertically using scroll elements or by touch operation (pressing and dragging).
It is possible to press the links contained in a web page using your finger. This operation is similar to a mouse click. The device executes selected links immediately and displays the destination as a new page in the browser window if the link is intended to display this in the same browser window. Links that are intended to display in a new browser window (such as popups) are not displayed by the device.

In the navigation bar (A), operating elements enabling navigation between the most recently viewed web pages are available (› = forward / ‹ = back). By pressing the element ⌂ the display in the browser window returns to the configured start page. If the element to the right of it is pressed, the browser window will refresh the most recently viewed page, i.e. reloads.

i The web browser can display static HTML pages. Scripts, add-ons or contents from special file formats (JAVA, Flash, PDF...) cannot be evaluated and displayed.

i The browser loads a web page by HTTP via Port 80. If the configured start page or a linked page cannot be loaded by the device, the browser window will display an error message.

ⓘ To ensure that the device can display web pages, the IP settings in the Windows® operating system must be configured correctly. This includes the device's own IP address, the sub-network mask, the addresses of the standard gateway (e.g. Internet router) and a valid DNS server as well as settings for an optionally available firewall or proxy server.

4.2.5 Parameters

Description	Values	Comment
□↲ Visualisation -> Pages -> Parameter Category "Function parameter"		
Enable external open page	Checkbox: Yes / No	As an alternative or supplement to the internal open page, all pages can also be displayed by an external bus telegram per recall. For this purpose, each page optionally has its own 1-bit communication object. If this parameter, which is available separately for each display page that can be opened, is set ("Yes"), the object "external open page" becomes visible in the configuration software. As as soon as a "1"-telegram is received via this object during the running time of the device, the on-screen display switches over immediately to the corresponding display page. In this way, screen pages can be opened by other bus devices (e.g. by KNX presence detectors if a person is present in the room). This parameter is only available for display pages that can be opened.
Password protection	No password Level 1 Level 2 Level 3 Level 4	The opening of pages can optionally be protected by a password. Up to 4 password levels are available for this in the device. To activate the password protection, a password level must be assigned here to a display page. The corresponding page will first then be displayed by an open page request (external or internal open page) if the correct password assigned to the level was entered. A keyboard is available on the screen for entering the password. This parameter is only available for display pages that can be protected by a password. The display page of the signalling system can be protected by its own password. In this case, the parameter has only one checkbox (Yes / No) that determines whether or not the password of the signalling system is active.
□↲ Visualisation -> Pages -> Parameter Category "Display parameter"		
Text	any text	Each display page can be provided with a text. This parameter defines the display text of a room or function page (e.g. "Living room" or "Datalogger"). Display pages of user and system settings can be labelled in this way as well. The preset text depends on the display

		page selected.
Name as text	Checkbox: Yes / No	In the configuration software, display pages are displayed in the structure view. Tree nodes in the structure view correspond directly to the display pages. Tree nodes bear the display text of the pages for better identification. The standard display text is entered automatically in the name of the tree node when creating a page. Optionally, the name of a tree node in the structure view can also vary from the display text of the page, however. This is is advisable, for instance, if pages in the configuration software should be identified continuously and described directly on the device in a user-friendly manner (e.g. name in the structure view: "Room 1" / Text in the visualisation: "bedroom"). This parameter defines whether or not the text in the visualisation is the same as the name in the configuration software. If the parameter is set ("Yes"), the texts are identical. If the parameter is not set ("No"), different texts can be defined for the display and for the name in the structure tree. The name in the structure tree can be edited.
Colour	Colour selection	The status texts of display elements of a KNX function are displayed in colour depending on the assigned function unit. This parameter predefines the colour of the status texts and values. Status elements can be assigned better to a function unit when reading the visualisation by means of different colour coding. The presetting of this parameter depends on the selected function unit. This parameter is only available for function unit pages.
Icon	Function unit 1 Function unit 2 Function unit 3 Function unit 4 Function unit 5 Light Temperature Venetian blind Safety Light scene	An icon can be assigned to each function unit page. The icons are visible on the function page of the main menu level (predefined display structure) in the tiles of the function units. The presetting of this parameter depends on the selected function unit. Newly created function units receive the icon "Light". This parameter is only available for function unit pages.

□↵ Visualisation -> Quicklinks-> Quicklink -> Parameter Category "Function parameter"

Target	Back + Selection of available display pages that allow a page jump.	In the footer of the display screen, Quicklinks can be displayed in the Quicklink bar. Quicklinks are operating elements with an icon display allowing an internal open page from display pages. Quicklinks are always visible and therefore available on any display page. Up to four Quicklinks are possible in the Quicklink bar. The destination of the open page is defined for each Quicklink by this parameter.

☐↵ Visualisation -> Quicklinks-> Quicklink -> Parameter Category "Display parameter"

Icon	Link neutral to the living room to the kitchen to the bathroom to the bedroom to child1 to child 2 outside to the garage to the cellar to page 1 to page 2 to page 3 to page 4 to the light for the blind for the heating for safety for the scene to function unit 1 to function unit2	An icon which is displayed in the operating element can also be defined for each Quicklink. An open page can be identified more easily by means of the icon (e.g. identification of a jump to a room page of the building structure or to a function unit page). There are 21 different icons to choose from here.

☐↵ Visualisation -> Rooms -> <Room name> -> KNX functions -> Parameter category "Function parameter"

Use feedback object	Checkbox: Yes / No	If this parameter is not selected ("No"), the transmitting communication objects of the function are bidirectional. The states received via the transmitting objects then influence the status indications. This is advisable, for instance, if the activated KNX switch actuator does not have any separate feedback objects. Alternatively, this parameter can be selected ("Yes") whereby the status elements are activated exclusively via the feedback objects. This parameter is only available for KNX functions that allow the feedback objects to be hidden.
	Time in ms, 600 ms	

Time between short and long time operation		In some functions, a distinction is made between short and long operations. The time which can be set here specifies from which actuation time the operating element evaluates a long operation.
Add keyboard	Checkbox: Yes / No	In some functions the transmission value can be preset using the on-screen keyboard. This parameter defines whether the on-screen keyboard can be used for value presetting (checkbox selected "Yes").
Scene	Undefined + A selection of available internal scenes.	In the function "Scene recall", it is possible to define here which internal scene is recalled via an operation.
Data point type	DPT 5.001...5.004 DPT 5.010 DPT 6.010 DPT 7.001 DPT 8.001 DPT 9.001 DPT 12.001 DPT 13.001 DPT 14.000...14.079	With the value transmitter functions telegrams in compliance with various KNX 1-byte, 2-byte and 4-byte data types can be transmitted to the bus. The activation of other bus devices enables the user with the 1-byte data formats, for example, to execute limiting value presettings or presettings for current counter statuses. With the 2-byte and 4-byte data formats it is possible to specify temperature or brightness values or to generate any preset values for other physical sizes with negative or positive signs. A sensor operation triggers the value telegram defined in the configuration software (transmission value). The parameter "data point type" determines the data format of the value transmitter object.
Display format	Percent (%) Degrees (°) User-defined	This parameter defines the display format of the value for the value transmitter functions. The settings "percent (%)" and "degree (°)" are only available with the "DPT 5.001...5.004". In "user-defined" the display format can be specified freely by the definition of an offset, factor and unit.
Offset	positive or negative number with decimal places, 0	The value offset is set here for the value transmitter functions in a user-defined display format.
Factor	positive or negative number with decimal places, 1	The value factor for the gain is set here for the value transmitter functions in a

		user-defined display format.
Transmission value	An adjustable positive or negative value, 0 depending on the predefined data type.	In the function "Value transmitter", a sensor operation triggers a telegram with a value defined by this parameter. It should be noted that the value transmitted via the communication object of the value transmitter can vary from the preset value during a sensor surface operation (presetting via transmission value in the configuration software or keyboard) because a gain factor and value offset can be configured optionally with some data types.
Minimum value	An adjustable positive or negative value depending on the predefined data type.	The parameters "Minimum value" and "Maximum value" scale the bar graph of the value transmitter functions and thus define the minimum and maximum displayable value. At full-scale deflection, the maximum value for the value range is set. If the bar graph shows no deflection, the minimum value is set. It should be noted that only values within the limits defined by these parameters can be specified via the on-screen keyboard or by a sensor surface operation. The presetting of these parameters depends on the configured data type.
Maximum value	An adjustable positive or negative value depending on the predefined data type.	
Initial increment	An adjustable positive value depending on the predefined data type, 5	In the "Value transmitter with adjustment function", the initial transmitter level (increment immediately after the operation) is configured by this parameter for a value adjustment. In the case of a value adjustment by a long button-press, the device first increases or decreases the value based on the initial increment. If the value adjustment lasts longer, the device increases the increment automatically so that the interval of the transmitted values becomes greater. Consequently, setpoints are reached faster.
Time between two telegrams	Time in ms, 1000 ms	In the "Value transmitter with adjustment function", this parameter specifies the time interval of the telegrams during a value adjustment.

Time between long and short button-press	Time in ms, 1000 ms	In the "Value transmitter with adjustment function", a distinction is made between short and long operations. The time which can be set here specifies from which actuation time the operating element evaluates a long operation (value adjustment).
Slat adjusting time	Time in ms, 600 ms	A "slat adjusting time" can be configured with the function "Venetian blind Step / Move / Step". If the sensor element is kept depressed long, the device transmits a long time telegram for starting up the drive and starts the "slat adjusting time". If the sensor element is released again within the slat adjusting time, the device transmits another short time telegram. This function is used for adjusting the slats of a blind. The function permits stopping the slats in any position during their rotation.
Slat correction	Checkbox: Yes / No	The function of the "Venetian blind/ positioning" supports the supplementary function of the slat correction. Many KNX shutter actuators track the slat position when the shutter height changes due to a position setting. These actuators also reposition the slats when the blind position is preset to 0%, i.e. to the upper end position. This repositioning of the slats is often undesirable in the upper end position of the Venetian blind since the returned blind height also changes again due to the movement of the slats (position of blind unequal 0%). To prevent the slat from being repositioned in the upper blind end position, the automatic slat correction can be activated here in the function "Venetian blind/ positioning". If the slat correction has been activated, the device always transmits a slat position of 0% for a blind height presetting of 0%. As a result, the slat is not repositioned when the upper end position is reached since this is already in the 0% position after the upward movement. It does not matter which operation performs the 0% presetting.
Frost protection selectable	Checkbox: Yes / No	In the functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX" an operation of

		the sensor surfaces switches over the possible operating modes (Comfort, Standby, Night reduction, Frost/heat protection) successively. It is possible to define which modes a user can select by a sensor surface operation by this parameter.
Comfort selectable	Checkbox: Yes / No	
Standby selectable	Checkbox: Yes / No	
Night reduction selectable	Checkbox: Yes / No	
Automatic operation selectable	Checkbox: Yes / No	The parameter "Automatic operation selectable" is only available for the function "Operating mode switchover KNX" and only when the switch-over affects the forced object on the controller.
Affects forced object	Checkbox: Yes / No	The "operating mode switchover KNX" can affect two objects on the room temperature controller. This will result in different alternative functions. "Affects forced object = Yes": The operating mode switchover affects the KNX forced object for the operating mode switchover on the controller (high priority). In this case, the sensor element can switch over the Operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection" by means of forced presetting. This presetting of the operating mode is normally called "Forced operation" in KNX controllers and cannot be overridden by other functions. In addition, it is possible to activate the automatic mode by an operation of the sensor surface. The forced presetting is then deactivated and the controller switches over to the operating mode that was set in normal operation. "Affects forced object = No": The operating mode switchover affects the normal KNX object for the operating mode switchover on the controller (low priority). In this case, the sensor element can switch over the operating modes "Comfort", "Standby", "Night reduction" and "Frost/heat protection". This presetting of the operating mode is normally called "Automatic mode" in KNX controllers and can be overridden by other functions with a higher priority (e.g. window status, KNX forced operating mode).
Time offset	-12...0...12	

		In the function "Date / Time (system time) and "KNX time" the time display can be shifted hourly by a time offset to adjust the time to various time zones. This parameter is provided for this purpose. The set value defines the time shift directly in hours.
Channel to be evaluated	1...16	In the function "collective feedback" the display element can display the switching state of an actuator channel. This parameter determines which channel of the collective feedback is evaluated. The display element only evaluates the specified channel in the collective feedback telegram.
On receipt of acoustic signal	Checkbox: Yes / No	Optionally, if using the "ASCII text display" function, the integrated signal encoder of the device can be contacted when a text is received. If the parameter "On receipt of acoustic signal" is set ("Yes"), the device will output a signal once for each new telegram. It is useful to use this acoustic display function if text displays should signal important events or states to the user of the device.
Upon receipt switch on display illumination / display element	Checkbox: Yes / No	Upon receipt of a value of the ASCII text display, the display will jump directly to the display page of the text display if this parameter is set ("Yes"). In this case, the display illumination is also switched to the work brightness. Otherwise ("No"), the updating of the text display element takes place in the background.
Disabling object available	Checkbox: Yes / No	With the function "ASCII text display" the acoustic signal and direct display of the text and switching on of the display illumination during the update can be suppressed - during the night for example - if necessary. The ASCII text display has its own disabling function for this purpose. As soon as the disabling function is active (telegram polarity configurable), the text display is still. The display element is then updated in the background. This parameter enables the use of the disabling function.

Behaviour of disabling object	1 = enabled / 0 = disabled 0 = enabled / 1 = disabled	This parameter defines the telegram polarity of the disabling object for the ASCII text display. This parameter is only available if the disabling function was enabled.
Target	Back + Selection of available display pages that allow a page jump.	In the function "Internal open page" the target of the open page is defined by this parameter.

□↵ Visualisation -> Rooms -> <Room name> -> KNX functions -> Parameter category "Display parameter"

Text	any text	Each KNX function can be provided with a text. This parameter defines the display text of the function (e.g. "switch ceiling luminaire" or "Venetian blind window"). The preset text depends on the configured function.
Name as text	Checkbox: Yes / No	In the configuration software, KNX functions are displayed as tree nodes also in the structure view below the rooms or function units. Tree nodes bear the display text of the function for better identification. The standard display text is entered automatically in the name of the tree node when creating a KNX function. Optionally, the name of a function node in the structure view can also vary from the display text, however. This is is advisable, for instance, if a KNX function in the configuration software should be described by its function and the data format and should be identified on the device in a user-friendly manner (e.g. name in the structure view: "Switching 1-bit" / Text in the visualisation: "switch ceiling luminaire"). This parameter defines whether or not the text in the visualisation is the same as the name in the configuration software. If the parameter is set ("Yes"), the texts are identical. If the parameter is not set ("No"), different texts can be defined for the display and for the name in the structure tree. The name in the structure tree can be edited.
Function unit	No function unit + A selection of available function units.	Each KNX function can be allocated to a function unit. This parameter defines the allocation. The presetting depends on the KNX function selected.

In start page	Checkbox: Yes / No	This parameter defines whether the KNX function is assigned to the start page. If the parameter is set ("Yes"), the function is available on the start page.
Behaviour	Display Button Rocker	Operating elements on the touch surface can - depending on the underlying function - be evaluated as a rocker switch (double-surface principle) or as a button (single surface principle). A rocker or button evaluation can be configured for the following KNX functions by this parameter: "Switching", "Dimming Start/Stop", "Venetian blind Step /Move/Step" and Rolling shutter Step/Move". The sensor evaluation (rocker or button) cannot be configured alternatively for all other functions, which is why the parameter selection is limited for these functions. With the functions "Switching", "Value transmitter", "Value transmitter adjustment function", "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX" it is possible to switch off the operating function completely (setting: "Display"). In this case, the channel concerned only works as a display function. Consequently, touching the display element does not induce any response. The "Display" setting is not available in the other KNX functions. The presetting of this parameter depends on the function selected.
Display value	Checkbox: Yes / No	This parameter specifies whether or not the status text or value as well as the status icon is displayed in the display element of the function.
Icon for 1	Icon selection, ON	Similarly to the status text, a symbol can be displayed in the display area. This parameter defines which type of status icon is used for the switching states "0" and "1" in the display element for the KNX function "Switching". This makes it possible to adapt the icon display to the activated function (e.g. switching of lighting). The status icon displays changes depending on the switching state thereby enabling the state of the controlled KNX function to be read clearly.

Icon for 0	Icon selection, OFF	These parameters are only available for the function "Switching".
Image text for 1	Text (max. 20 characters), ON	This parameter defines which status texts for the KNX function "Switching" are displayed for the states "0" and "1" in the display element. After a device reset, the display shows "---" until an object value of the status text is received or predefined.
Image text for 0	Text (max. 20 characters), OFF	These parameters are only available for the function "Switching".
Icon	Icon selection	Similarly to the status text, a symbol can be displayed in the display area. This parameter defines which type of status icon is used in the display element. This makes it possible to adapt the icon display to the activated function (e.g. dimming of lighting). The status icon displays changes dynamically depending on the function state thereby enabling the state of the controlled KNX function to be read clearly (identification "dynamic" in the symbol names). Static symbols only can be displayed for other functions. This parameter is only available for functions whose functions can be specified variably. The presetting depends on the selected function.
Unit	Unit selection, %	With this parameter it is possible to configure the unit displayed behind the status value for the KNX functions "Value transmitter" and "Value transmitter adjustment function". This parameter is only available if the display format is preset to "user-defined".
Format	# #.# #.## #.###	This parameter defines the formatting and thus the number of visible decimal places (if available) of the status value for the value transmitter functions.
Image text for comfort mode	Text (max. 25 characters), Comfort	This parameter sets the status text for an active comfort mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX".

Image text for standby operation	Text (max. 25 characters), Standby	This parameter sets the status text for an active standby mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX".
Image text for night reduction	Text (max. 25 characters), Night reduction	This parameter sets the status text for an active night mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX".
Image text for frost/heat protection	Text (max. 25 characters), Frost/heat protection	This parameter sets the status text for an active frost/heat protection mode for the KNX functions "Operating mode switchover 4 x 1-bit" and "Operating mode switchover KNX".
Image text for automatic mode	Text (max. 25 characters), Automatic	This parameter sets the status text for an automatic mode only for the KNX function "Operating mode switchover KNX" (for activation of a KNX forced object).

Some parameters of the following parameter groups have already been described in the parameter groups listed previously. For this reason, these parameters will not be listed once again here.

□↵ Visualisation -> Free project design -> Parameter category "Function parameter"

Function	no function connect to function... ASCII text Operating mode switchover 4 x 1 bit Operating mode switchover KNX Dimmer actuator load type Dimming brightness value Dimming Start/Stop Internal open page Venetian blind position Venetian blind Step/Move KNX date KNX time Light scene recall Shutter position Rolling shutter Step/Move Collective feedback Switching System Date/time Value transmitter Restraint	The function of the element is specified on a master page or page with this parameter.

Identifier	Master.Element....	This parameter then becomes effective when an element is assigned to a master. The "Identifier" parameter has another default value depending on the selected function of the element. For example, the value "Master.Element.ASCII text display" for the function "ASCII text" or the value "Master.Element.Internal open page" for the function "Internal open page". This value can be adapted according to the user. With aid of this identifier, it is possible to select this element easily, for example, with the function "Connect to function...".
Identifier	Page.Element....	This parameter then becomes effective when an element is allocated to a page. The "Identifier" parameter has another default value depending on the selected function of the element. For example, the value "Page.Element.ASCII text display" for the function "ASCII text" or the value "Page.Element.Internal open page" for the function "Internal open page". This value can be adapted according to the user. With aid of this identifier, it is possible to select this element easily, for example, with the function "Connect to function...".
Action	no function	This parameter is only effective if "ASCII text" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	Text No indication	This parameter is only effective if "ASCII text" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Activate standby Activate frost/heat protection Activate night reduction Activate comfort Previous operating mode Next operating mode	This parameter is only effective if "Operating mode switchover 4 x 1 bit" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	Status indication No indication	This parameter is only effective if "Operating mode switchover 4 x 1 bit" is selected as a function of the element. It specifies which value is displayed in the

		element.
Action	no function Activate standby Activate frost/heat protection Activate night reduction Activate comfort Previous operating mode Next operating mode	This parameter is only effective if "Operating mode switchover KNX" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	Status indication No indication	This parameter is only effective if "Operating mode switchover KNX" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function	This parameter is only effective if "Dimmer actuator load type" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	Status indication No indication	This parameter is only effective if "Dimmer actuator load type" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Brighter (On) Darker (OFF) Edit	This parameter is only effective if "Dimming brightness value" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	Status indication No indication	This parameter is only effective if "Dimming brightness value" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Brighter (On) Darker (OFF) Brighter / darker (TOGGLE)	This parameter is only effective if "Dimming Start/Stop" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	Status indication No indication	This parameter is only effective if "Dimming Start/Stop" is selected as a function of the element. It specifies which value is displayed in the element.

Action	no function Open page	This parameter is only effective if "Internal page recall" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication	This parameter is only effective if "Internal page recall" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Blind/shutter DOWN Blind/shutter UP Edit blind/shutter Slat Up Slat closed Edit slat	This parameter is only effective if "Venetian blind position" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Blind/shutter position Slat position	This parameter is only effective if "Venetian blind position" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function up Down Toggle	This parameter is only effective if "Venetian blind Step/Move" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Blind/shutter position Slat position	This parameter is only effective if "Venetian blind Step/Move" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function	This parameter is only effective if "KNX Date" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication KNX date	This parameter is only effective if "KNX Date" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function	This parameter is only effective if "KNX Time" is selected as a function of the element. It specifies which action is executed if the element is actuated.

Value	No indication KNX Time	This parameter is only effective if "KNX Time" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Recall scene	This parameter is only effective if "Light scene recall" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Status indication	This parameter is only effective if "Light scene recall" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Blind/shutter DOWN Blind/shutter UP Edit blind/shutter	This parameter is only effective if "Rolling shutter position" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Blind/shutter position	This parameter is only effective if "Rolling shutter position" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function up Down Toggle	This parameter is only effective if "Rolling shutter Step/Move" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Blind/shutter position	This parameter is only effective if "Rolling shutter Step/Move" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function	This parameter is only effective if "Collective feedback" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Status indication	This parameter is only effective if "Collective feedback" is selected as a function of the element. It specifies which value is displayed in the element.

Action	no function On Off Toggle Pushbutton function ON Pushbutton function Off	This parameter is only effective if "Switching" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Status indication	This parameter is only effective if "Switching" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function	This parameter is only effective if "System date/time" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Status indication	This parameter is only effective if "System date/time" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Transmit value Edit	This parameter is only effective if "Value transmitter" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Feedback value transmitted value	This parameter is only effective if "Value transmitter" is selected as a function of the element. It specifies which value is displayed in the element.
Action	no function Transmit value Edit	This parameter is only effective if "Restraint" is selected as a function of the element. It specifies which action is executed if the element is actuated.
Value	No indication Status indication	This parameter is only effective if "Restraint" is selected as a function of the element. It specifies which value is displayed in the element.

□↵ Visualisation -> Free project design of parameter category "Display parameter"

Background colour	Colour selection: Transparent	This parameter is only effective if the display parameters of a master page are edited. It specifies the background colour of the page master. A colour selection with predefined colours is available under this parameter for selecting the required colour. A colour

		pallet opens by double-clicking one of the predefined colours. The project engineer is then able to mix any required colour and to apply it to the colour selection. The setting of gradients or a transparent background is also possible.
Background colour	Colour selection: Grey	This parameter is only effective if the display parameters of a page are edited. It specifies the background colour of the page. A colour selection with predefined colours is available under this parameter for selecting the required colour. A colour pallet opens by double-clicking one of the predefined colours. The project engineer is then able to mix any required colour and to apply it to the colour selection. The setting of gradients or a transparent background is also possible.
Wallpaper	Image selection: No image	This parameter specifies the wallpaper of a master or page. A choice of several icons is provided. In addition, it is possible to integrate coloured images in BMP and JPG formats.
Image aspect ratio	Original size Tiles Adjusted Stretched Stretched proportional	This parameter is used for adapting the format of the wallpaper.
Coordinates (x; y; width; height)	(0.00; 0.00; 150.0; 75.0)	The element can be placed exactly on any desired position of a page or master page by entering the coordinates. Furthermore, the display size of the element can be predefined.
Labelling: Position	None Top left Top middle Top right Middle right Bottom right Bottom middle bottom left Middle left Centre	This parameter defines the position where the labelling is displayed on the element, which was entered below the "Text" parameter.
Labelling: Font colour	Colour selection: Black	The labelling specified by the "Text" parameter can be displayed in different

		colours. A colour selection with predefined colours is available under this parameter for selecting the required colour. A colour pallet opens by double-clicking one of the predefined colours. The project engineer is then able to mix any required colour and to apply it to the colour selection.
Labelling: Font	Font selection: JUNG Single Regular Font size default: 20	The labelling entered under the "Text" parameter can be formatted using the setting options of this parameter. The font (e.g. JUNG Single Regular, DejaVu LGC Sans, etc.) and font size can be adapted. Additional possibilities include the option of formatting the text bold or in italics.
Icon: Position	None Top left Top middle Top right Middle right Bottom right Bottom middle bottom left Middle left Centre	In addition to a label, it is also possible to display an icon on an element. For example, to indicate the function of the element graphically. This parameter defines the position within the element where the icon is displayed.
Icon	Image selection: No image	In addition to a label, it is also possible to display an icon on an element. For example, to indicate the function of the element graphically. This parameter defines which icon is displayed. A choice of several icons is available for this purpose. In addition, it is possible to integrate coloured images in BMP and JPG formats.
Value: Position	None Top left Top middle Top right Middle right Bottom right Bottom middle bottom left Middle left Centre	This parameter defines the position where the value (e.g. status display) is displayed within the element.
Value: Font colour	Colour selection: Black	The value specified by the "Value" function parameter can be displayed in different colours. A colour selection with predefined colours is available under

		this parameter for selecting the required colour. A colour pallet opens by double-clicking one of the predefined colours. The project engineer is then able to mix any required colour and to apply it to the colour selection.
Value: Font	Font selection: JUNG Single Regular Font size default: 20	The value (e.g. status indication) can be formatted using the setting options of this parameter. The font (e.g. JUNG Single Regular, DejaVu LGC Sans, etc.) and font size can be adapted. Additional possibilities include the option of formatting the text bold or in italics.
Background colour	Colour selection: Grey	This parameter is only effective if the display parameters of an element have been edited. It specifies the background colour of the element. A colour selection with predefined colours is available under this parameter for selecting the required colour. A colour pallet opens by double-clicking one of the predefined colours. The project engineer is then able to mix any required colour and to apply it to the colour selection. The setting of gradients or a transparent background is also possible.
Background colour on pressing button	Colour selection: Blue	Each element can be allocated a background colour on pressing a button. This may vary from the normal background colour. The operator receives direct feedback on the device as to whether or not the operation of the element was successful. A colour selection with predefined colours is available under this parameter for selecting the required colour. A colour pallet opens by double-clicking one of the predefined colours. The project engineer is then able to mix any required colour and to apply it to the colour selection. The setting of gradients or a transparent background is also possible.

□↵ Datalogger -> <Datalogger-Channel>

Data type	DPT 5.001 … 5.004 (1 byte relative value) DPT 5.010 (1 byte – counter) DPT 6.010 (1 byte counter	The datatype of the datalogger channel can be set here.

	with plus/minus sign) DPT 7.001 (2 byte – counter) DPT 8.001 (2 byte – counter with plus/minus sign) DPT 9.001 … 9.021 (2 byte – value) DPT 12.001 (4 byte – counter) DPT 13.001 (4 byte counter with plus/minus sign) DPT 14.000 … 14.079 (4 byte – IEEE float)	
Interval time	Minute Hour Day Week Month	Telegrams reaching the communication object are divided into various time intervals and assigned to them. At the end of each time period, the telegrams received are evaluated and a minimum and maximum interval value determined. In addition, an average value is calculated and saved. To evaluate a differential calculation, the last respective data value of an interval is also saved. The smallest and largest values are evaluated as the minimum and maximum values. To calculate the average, the recorded values are totalled and divided by the number of recorded values. If, within a time period, only one telegram data value was received, then the minimum value = maximum value = average value. The time interval for the detection of data telegrams can be configured separately by this parameter.
Poll cyclically	Checkbox: Yes / No	With activated cyclic polling, the device transmits a value read telegram (ValueRead) to the bus regularly, after a period of time has elapsed. The data source must then return a value response telegram (ValueResponse). The "Read" flag must be set on the transmitting object of the data source for this to function correctly.
Poll interval	*	The polling interval of the cyclic object poll can be set here. This parameter is only visible on "Poll cyclically = Yes".

		*: The setting options automatically align themselves to the configured interval time. This ensures that at least one data value is requested within a time period.
Specify start value for difference formation	Checkbox: Yes / No	If the data source is a counter (e.g. electricity meter, people counter, etc.), the data display in the value-time diagram can be configured to differential calculation. A difference between the last value to arrive of the current interval and the last valued of the previous interval - depending on minimum, maximum or average value - is calculated here and displayed as a differential value, provided that the diagram is configured to differential display. If a starting value is used, the device then directly evaluates the last data value of the first time period after the reset and then shows the difference in relation to the starting value in the display diagram. In no start value for differential calculation is configured, the device automatically evaluates the first data value received as the start value.
Start value for difference formation	0	After a device reset (power failure, programming operation), the differential calculation starts at a specified starting value. This is required to initialise the differential formation, so that a differential value can be calculated in the first recording period after a reset. This means that, in addition, there can be an adjustment to defined basic counter levels - for example after the installation of a new electricity meter. The system project planner must enter the starting value here if the parameter "Specify start value for difference formation" is set ("Yes").
Send e-mail on memory overflow	Checkbox: Yes / No	If the device is connected to a network via an Ethernet connection and an e-mail account is also configured to send e-mail messages, the data values recorded by a datalogger channel can be sent cyclically by e-mail. In this case, the device prepares the data in a CSV file and sends it to a specified receiver in a standard e-mail. The e-mail is sent automatically each time the number of data records stored in the file system reaches 10,000. A data record consists of the minimum value, maximum value, average value

		and the last value (for calculating a difference) of a time interval.
Recipient address	No presetting	The e-mail address of the recipient of the automatically generated datalogger e-mail message must be configured here. The input format of the address is specified as "local@domain" (example: "xxx@yyy.de"). This parameter is only visible on "Send e-mail on memory overflow = Yes".

☐↵ Visualisation -> Functions -> Datalogger -> <Datalogger Diagram> -> Parameter Category "Function parameter"

Y axis: Scaling	Automatic Manual	The Y axis can be scaled automatically according to the values to be displayed (specified by minimum and maximum values of the recording period / "Automatic" setting) or, alternatively, can be permanently configured in a value range ("Manual" setting). If the scaling of the Y axis is fixed, and there is a data value outside the specified minimum or maximum limits, then the data value curve is drawn in vertically upwards or downwards from the two neighbouring data points.
Y axis: Min. axis scaling	0	The lower minimum value of the Y axis can be defined at this point. The value may be either positive or negative, but may not exceed the maximum value. During setting, it should be ensured that the expected datalogger values do not undershoot the minimum value. Otherwise the data value curve would be drawn vertically downward from the two neighbouring data points of the undershoot. This parameter is only visible on "Y axis: scaling = manual".
Y axis: Max. axis scaling	100	The upper maximum value of the Y axis can be defined at this point. The value may be either positive or negative, but may not undershoot the minimum value. During setting, it should be ensured that the expected datalogger values do not exceed the maximum value. Otherwise the data value curve would be drawn vertically upward from the two neighbouring data points of the overshoot. This parameter is only visible on "Y axis: scaling = manual".

Number of subdivisions	1...5...10	The Y axis can be given subdivisions to simplify the legibility of the diagram. This parameter specifies the number of subdivisions.
Curve 1	--- ... Selection list of the datalogger channels	The datalogger channel of the first curve to be displayed is selected here. In a display element, only those channels with the same interval times can be displayed. The selection of the parameter adapts itself accordingly. For a selection to be possible here, at least one datalogger channel must have been added in the structure view in the area "Datalogger" in advance.
Colour	Colour selection	A datalogger diagram can display the measured values of up to three datalogger channels in curve format. Each curve is represented in its own colour. On the bottom edge of the display element in the form of a legend the configurable curve colours are displayed here supplemented by the name of the curve. This allows better identification of the curves. The legend is only visible when the parameter "Display legend" is selected in the display parameters.
Name	Text	A datalogger diagram can display the measured values of up to three datalogger channels in curve format. Each curve is represented in its own colour. On the bottom edge of the display element in the form of a legend the individual curve colours are displayed here supplemented by the configurable name of the curve. This allows better identification of the curves. The legend is only visible when the parameter "Display legend" is selected in the display parameters.
Amplification	1	Reinforcement (multiplicator) can be added to the measured values of a channel to allow the option of modification to the desired measured value ranges in the diagram.
Offset	0	A static offset can be added to the measured values of a channel to allow

		the option of modification to the desired measured value ranges in the diagram. An offset not equal to "0" shifts the curve along the Y axis in a positive or negative direction.
Curve type	Average Minimum Maximum Difference value	The data values received from the bus are transmitted to the datalogger display as minimum, maximum and average values by the KNX function part (BCU) at the end of a time interval. To calculate the differential value, the last respective value of a time interval is also forwarded to the display. The smallest and largest values are evaluated as the minimum and maximum values. To calculate the average, the recorded values are totalled and divided by the number of recorded values. If, within a time period, only one telegram data value was received, then the minimum value = maximum value = average value. When displaying a differential value, a difference between the last value to arrive of the current interval and the last value of the previous interval - depending on minimum, maximum or average values - is calculated and displayed as a differential value. This parameter specifies which recorded data value is to be displayed in the diagram as the "curve type" (differential value, maximum value, minimum value or average value).
Curves 2 and 3 like curve 1!		

□↵ Visualisation -> Functions -> Datalogger -> <Datalogger Diagram> -> Parameter Category "Function parameter"

Additional text	Text	As soon as the tile of the datalogger is selected in the function view, the display branches to the datalogger page. A list of all datalogger diagrams created in the device is displayed there in button shape. In the individual buttons, any additional text can be displayed in the operating element, which can be configured here. This additional text can optionally describe the displayed data values in the diagram (e.g. "Heating command value").
Display legend	Checkbox: Yes / No	A datalogger diagram can display the measured values of up to three

		datalogger channels in curve format. Each curve is represented in its own colour. On the bottom edge of the display element in the form of a legend the curve colours are displayed supplemented by the name of the curve. This allows better identification of the curves. This parameter determines whether the legend is visible or not.
Y axis: Display axis title	Checkbox: Yes / No	The Y axis of the graphic display can be described by a heading. This parameter defines whether the text heading of the Y axis should be displayed in the diagram.
Y axis: Axis title	Text	The Y axis title is specified here. This parameter is only visible when the axis title of the Y axis is to be displayed.
Y axis: Display axis labelling	Checkbox: Yes / No	The axis labelling of the Y axis can be shown or hidden. With axis labelling, only the subdivisions and additional lines are shown, but not the numeric values of the scale (minimum and maximum value).
Y axis: Axis labelling format	#,#	This parameter can be used to specify the format of the displayed numeric values of the Y axis scale. This parameter is only visible on "Y axis: display axis labelling = No".

☐↤ Logic Editor -> Logic gate -> <Logic gate>

Identifier	Input, Text	Predefined designation that only appears in the configuration software, identifies an input more exactly and can be modified as required.
Behaviour input	Normal inverted	It is possible to specify here whether the appropriate gate input is evaluated normally, i.e. not inverted, or inverted.
Logic operation	AND OR Exclusive OR AND with feedback	This parameter defines the logical link function. With an "AND with return", the value of the output is fed back internally to input 1. The result of this is that the output can only have the value "1" when all the other inputs are set to "1" and input 1

		receives the value "1" as the last input..
Transmit on	Each input event Change the output	In the "Transmit on each input event" setting, a new output telegram is sent when the value of the output has not changed on updating or a change to an input. When multiple logic gates are used, this can lead to a higher bus load. In the "Transmit on output change" setting, the bus load is minimised by only transmitting the output telegram when the switching state has also changed.
Filter	No Only transmit 1-telegrams Only transmit 0-telegrams	A filter function can be optionally activated for the output at this point. The filter function set here specifies which output telegrams are transmitted to the bus and are thus forwarded.
Behaviour output	Normal inverted	It is possible to specify here whether the gate output is evaluated normally, i.e. not inverted, or inverted.
Switch-on delay	Checkbox: Yes / No	A switch-on delay can be configured if required. Depending on the set time, telegrams of the output are transmitted to the bus after a delay depending on the result of the logical link ("1"-telegram). This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.
Switch-on delay time	1...255 x 100 ms 1...255 x 1 second 1...255 x 1 minute	The time of the switch-on delay is defined here. This parameter is only visible if the switch-on delay is active.
Switch-off delay	Checkbox: Yes / No	A switch-off delay can be configured if required. Depending on the set time, telegrams of the output are transmitted to the bus after a delay depending on the result of the logical link ("0"-telegram). This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.
Switch-off delay time		

	1...255 x 100 ms 1...255 x 1 second 1...255 x 1 minute	The time of the switch-off delay is defined here. This parameter is only visible if the switch-off delay is active.
Activate cyclical transmission	Checkbox: Yes / No	Optionally, the output of a logic gate can transmit the status cyclically to the bus (e.g. for telegram monitoring in actuators). An output only transmits cyclically if the filter criterion is met (see above) In the case of configured switch on / or switch off delays, the status of the cyclical telegram first changes after a logical change in status after the delay time has elapsed.
Disabling object available	Yes No	The logic gate can optionally be fitted with a disabling object. If the disabling object is used, the gate ignores changes to the inputs when the disabling is active.
Behaviour of disabling object	1 = enabled / 0 = disabled 0 = enabled / 1 = disabled	The telegram polarity of the disabling object can be set here. This parameter is only visible on "disabling object available = Yes".
Transmit after disabling is enabled	Checkbox: Yes / No	After the block, the current input values can immediately be processed further ("Yes" setting), or the logic gate waits for the next input telegrams ("No" setting). This parameter is only visible on "disabling object available = Yes".

□↵ Logic Editor -> Demultiplexer 1to2 / Demultiplexer 1to4 -> <Demultiplexer>

Object type Input/Output	DPT 1.001 (1 bit switching) DPT 3.007 (4 bit – dimming) DPT 5.001 … 5.004 (1 byte relative value) DPT 5.010 (1 byte – counter) DPT 6.010 (1 byte counter with plus/minus sign) DPT 7.001 (2 byte – counter) DPT 8.001 (2 byte – counter with plus/minus	The input and the outputs of a multiplexer channel always have the same object type, which can be configured here. Different channels of a multiplexer may user different object types.

	sign) DPT 9.001 … 9.021 (2 byte – value) DPT 12.001 (4 byte – counter) DPT 13.001 (4 byte counter with plus/minus sign) DPT 14.000 … 14.079 (4 byte – IEEE float)	
Disabling object available	Checkbox: Yes / No	The multiplexer can optionally be fitted with a disabling object. During a block. no values are forwarded from the input to the outputs.
Behaviour of disabling object	1 = enabled / 0 = disabled 0 = enabled / 1 = disabled	The telegram polarity of the disabling object can be set here. This parameter is only visible on "disabling object available = Yes".
Transmit after disabling is enabled	Checkbox: Yes / No	After the block, the current input value can immediately be processed further ("Yes" setting), or the multiplexer waits for the next input telegrams ("No" setting). This parameter is only visible on "disabling object available = Yes".

□↵ Logic Editor -> Timers -> <Timer>

Filter ON ->	--- ON OFF Toggle	This parameter defines the filter function for the input telegram value "1" (ON). The timer filters or transforms the input value depending on this setting.
Filter OFF ->	--- ON OFF Toggle	This parameter defines the filter function for the input telegram value "0" (OFF). The timer filters or transforms the input value depending on this setting.
Switch-on delay	Checkbox: Yes / No	A switch-on delay can be configured if required. Depending on the set time, the filtered input telegrams are then forwarded to the output with the value "1" (ON) after a delay.
Switch-on delay time	1...255 x 100 ms 1...255 x 1 second	The time of the switch-on delay is defined here. This parameter is only

	1...255 x 1 minute	visible if the switch-on delay is active.
Switch-off delay	Checkbox: Yes / No	A switch-off delay can be configured if required. Depending on the set time, the filtered input telegrams are then forwarded to the output with the value "0" (OFF) after a delay.
Switch-off delay time	1...255 x 100 ms 1...255 x 1 second 1...255 x 1 minute	The time of the switch-off delay is defined here. This parameter is only visible if the switch-off delay is active.
Disabling object available	Checkbox: Yes / No	The filtering/timer can also be fitted with a disabling object. If the disabling object is used, the timer ignores changes to the input when the disabling is active.
Behaviour of disabling object	1 = enabled / 0 = disabled 0 = enabled / 1 = disabled	The telegram polarity of the disabling object can be set here. This parameter is only visible on "disabling object available = Yes".
Transmit after disabling is enabled	Checkbox: Yes / No	After the block, the current input value can immediately be processed further ("Yes" setting), or the timer waits for the next input telegram ("No" setting). This parameter is only visible on "disabling object available = Yes".

□ Logic Editor -> Limiting values -> <Limiting value>

Datapoint type	DPT 5.001 … 5.004 (1 byte relative value) DPT 5.010 (1 byte – counter) DPT 6.010 (1 byte counter with plus/minus sign) DPT 7.001 (2 byte – counter) DPT 8.001 (2 byte – counter with plus/minus sign) DPT 9.001 … 9.021 (2 byte – value) DPT 12.001 (4 byte – counter)	The device allows the limiting value monitoring of 1-byte, 2-byte and 4-byte values in different data formats. This parameter defines the data format of the limiting value input object.

	DPT 13.001 (4 byte counter with plus/minus sign) DPT 14.000 … 14.079 (4 byte – IEEE float)	
Display format	Percent (%) Degrees (°) User-defined	With the datapoint type "DPT 5.001...5.004" the display format for representing the user settings directly on the device can be defined by this parameter. In the case of all other data point types, the display format is preset to "user-defined".
Offset	0	Setting of the value offset for formatting the user settings directly on the device in the case of user-defined display format.
Factor	1	Setting of the value gain for formatting the user settings directly on the device in the case of user-defined display format.
Format	# #,# #,## #,###	Setting of the visible decimal places for formatting the user settings directly on the device in the case of user-defined display format.
Unit	%, Unit selection	Setting of the unit of the editable value for formatting the user settings directly on the device in the case of user-defined display format.
Transmit limiting value on initialisation	Checkbox: Yes / No	If this parameter is set, the device evaluates the input value immediately after a device reset (commissioning operation or bus voltage return) and initialises the 1-bit limiting value objects. Consequently, the 1-bit limiting value objects also send the current state to the bus.
Upper limiting value active	Checkbox: Yes / No	This parameter can define whether the input value is monitored at an upper limit.
Upper limiting value	Value dependent on the datapoint type	This parameter defines the upper limiting value to be monitored if this is activated. The lower limiting value

		predefined here can be changed directly on the device in the user and system settings at any time and can therefore be adapted to individual needs or requirements. The formatting of the value in the input field of the configuration software and in the presetting during the course of the user settings directly on the device is defined by the lower level parameters of the data point type (offset, factor, format).
Hysteresis upper limiting value	0	A hysteresis is assigned to each limiting value. The hysteresis serves to prevent frequent switching backwards and forwards when there is a measured value in the approximate area of the limiting value. The setting "0" deactivates the hysteresis. In the case of the upper limiting value, the hysteresis is deducted from the limiting value. The hysteresis - like the limiting value itself - is an absolute value and is only defined in the configuration software.
Behaviour on exceeding upper limiting value	No action 1 telegram 0 telegram	This parameter defines the switching command transmitted to the bus via the object 1-bit limiting value object. The device compares the current input value continuously with the set upper limiting value and decides on this basis whether the configured switching command should be transmitted if the upper limiting value is exceeded at this point.
Behaviour on not reaching upper limiting value – hysteresis	No action 1 telegram 0 telegram	This parameter defines the switching command transmitted to the bus via the object 1-bit limiting value object. The device compares the current input value continuously with the set upper limiting value and the corresponding hysteresis and decides on this basis whether the configured switching command should be transmitted minus the hysteresis if the upper limiting value is fallen short of at this point.
Transmission delay upper limiting value	No delay 1 s, 3 s, 5 s, 10 s, 15 s, 30 s, 1 min., 3 min., 5 min., 10 min., 15 min., 30 min., 60 mins.	The switching telegrams of the upper limiting value object can be transmitted to the bus after a delay if required. This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.

Upper limiting value changeable	Checkbox: Yes / No	The upper limiting value can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the upper limiting value in the configuration software is configured here as changeable.
Upper limiting value changeable externally	Checkbox: Yes / No	The upper limiting value can also be optionally changed externally via a communication object. If this parameter is set, a communication object is also available that can change the upper limiting value during the running time of the device. The data format of this object corresponds to the datapoint type of the limiting value set in the configuration software.
Lower limiting value active	Checkbox: Yes / No	This parameter can define whether the input value is monitored at a lower limit.
Lower limiting value	Value dependent on the datapoint type	This parameter defines the lower limiting value to be monitored if this is activated. The lower limiting value predefined here can be changed directly on the device in the user and system settings at any time and can therefore be adapted to individual needs or requirements. The formatting of the value in the input field of the configuration software and in the presetting during the course of the user settings directly on the device is defined by the lower level parameters of the data point type (offset, factor, format).
Hysteresis of lower limiting value	0	A hysteresis is assigned to each limiting value. The hysteresis serves to prevent frequent switching backwards and forwards when there is a measured value in the approximate area of the limiting value. The setting "0" deactivates the hysteresis. In the case of the lower limiting value, the hysteresis is added to the limiting value. The hysteresis - like the limiting value itself - is an absolute value and is only defined in the configuration software.
		This parameter defines the switching command transmitted to the bus via the

Behaviour on not reaching lower limiting value	No action 1 telegram 0 telegram	object 1-bit limiting value object. The device compares the current input value continuously with the set lower limiting value and decides on this basis whether the configured switching command should be transmitted if the lower limiting value is fallen short of at this point.
Behaviour on exceeding the lower limiting value + hysteresis	No action 1 telegram 0 telegram	This parameter defines the switching command transmitted to the bus via the object 1-bit limiting value object. The device compares the current input value continuously with the set lower limiting value and the corresponding hysteresis and decides on this basis whether the configured switching command should be transmitted in addition to the hysteresis if the lower limiting value is exceeded at this point.
Transmission delay lower limiting value	No delay 1 s, 3 s, 5 s, 10 s, 15 s, 30 s, 1 min., 3 min., 5 min., 10 min., 15 min., 30 min., 60 mins.	The switching telegrams of the lower limiting value object can be transmitted to the bus after a delay if required. This function is used for suppressing brief changes in the status. A change in the status is not transmitted to the bus if the status should change once again within a time delay.
Lower limiting value changeable	Checkbox: Yes / No	The lower limiting value can be changed directly on the device in the user and system settings and can therefore be adapted to individual needs or requirements. This is only possible, however, if the lower limiting value in the configuration software is configured here as changeable.
Lower limiting value changeable externally	Checkbox: Yes / No	The lower limiting value can also be optionally changed externally via a communication object. If this parameter is set, a communication object is also available that can change the lower limiting value during the running time of the device. The data format of this object corresponds to the datapoint type of the limiting value set in the configuration software.

□↵ Timer -> Timer - Global settings

Astro: geographic longitude of the location	9.5	For the astro function of the timer switch to work correctly, the geographic position must be set. This parameter

		defines the geographic position (longitude) of the installation location of the device.
Astro: Geographic latitude of the location	51.31	For the astro function of the timer switch to work correctly, the geographic position must be set. This parameter defines the geographic position (latitude) of the installation location of the device.
Time for synchronisation of the switching times	00:00...23:59	The KNX function part executes the timer commands independently. To ensure that it can also do this, the KNX function section needs regular information regarding the switching times that were last programmed by the installation engineer or user when the operating system and thus the KNX application are in idle mode. The KNX function part can temporarily store and execute the switching times every 24 hours. If the temporarily stored switching times have been executed, the KNX function part must be resynchronised with switching times. The synchronisation takes place cyclically depending on the time of day, or when the KNX module has executed all switching times in one day. The time of the day when the recurrent synchronisation should take place can be defined here. The parameter "Time for synchronisation of the switching times" defines the time for the synchronisation process regardless of whether or not the KNX module still has switching times. In addition, the KNX module requests switching times automatically if it has executed all switching times in one day.

□↵ Timer -> Timer - Global settings -> <timer switch channel >

Type of timer switching channel	Switching Operating mode switchover 4 x 1 bit Operating mode switchover KNX Scene DPT 5.001 … 5.004 (1 byte relative value) DPT 5.010 (1 byte – counter)	The switching times of a timer switch channel directly affect the communication objects of the channel and handle the data format defined here.

	DPT 6.010 (1 byte counter with plus/minus sign) DPT 7.001 (2 byte – counter) DPT 8.001 (2 byte – counter with plus/minus sign) DPT 9.001 … 9.021 (2 byte – value) DPT 12.001 (4 byte – counter) DPT 13.001 (4 byte counter with plus/minus sign) DPT 14.000 … 14.079 (4 byte – IEEE float)	
Random: max. time offset [min.]	0...30	The switching times of a channel can be triggered offset in a set random period. Each day at 00:00, the device calculates a time offset individually and randomly for each switching time, by which a switching time is brought forward minute-by-minute (-) or is set back (+). The maximum time offset between the set switching time and the actual time of the version can be configured using this parameter. This allows time offsets of between 1 and 30 minutes. The setting "0" for the time offset completely deactivates the random function for the timer switch channel. The device randomly determines a time from the configured maximum time offset and adds this time either to the set switching time or, alternatively, subtracts it from the switching time.
Astro: Channel affects	Shadow Lighting	The astro function allows the control of a lighting or shading system depending on sunrise and sunset and a limit time (switching time). An astro function usually affects lighting (e.g. exterior lighting) or shading (e.g. roller shutters). The behaviour of the device when processing the astro switching times varies according to these applications. This parameter defines the astro behaviour irrespective of the set data format of the channel.
	-120...0...120	

Astro: Offset morning [min.]		Optionally, the astro time for the morning determined by the device can be statically shifted in the minute range. Thus, the switching times influenced by astro can be individually adapted to local conditions (e.g. influence by high mountains or forests). This parameter defines the astro time shift during the morning.
Astro: Offset evening [min.]	-120...0...120	Optionally, the astro time for the evening determined by the device can be statically shifted in the minute range. Thus, the switching times influenced by astro can be individually adapted to local conditions (e.g. influence by high mountains or forests). This parameter defines the astro time shift during the evening.
Disabling object available	Yes No	A disabling object is optionally available for every timer switch channel. Timer switch channels can be locked via the disabling objects during the running time of the device. In these cases, the objects of the timer switch channels do not transmit when a switching time occurs.
Behaviour of disabling object	1 = enabled / 0 = disabled 0 = enabled / 1 = disabled	The telegram polarity of the disabling object can be set here. This parameter is only visible on "disabling object available = Yes".
Transmit after disabling is enabled	Checkbox: Yes / No	If the parameter "Transmit after disabling is enabled" is set, the device evaluates the configured switching times upon re-enabling. If one or more switching times were not executed during the previously active disable phase, the device carries out the execution of the last switching time and transmits a corresponding telegram to the bus via the communication object of the timer switch channel. If the parameter "Transmit after disabling is enabled" is not set, the switching times will be ignored upon re-enabling. In this case, switching times skipped by the disabling function are not carried out.

☐↵ E-Mail -> Event Mails -> <Event Mail>

Send e-mail on

	0 telegram 1 telegram	"Definition of the telegram polarity for the object of the corresponding event e-mail. The e-mail is sent when a telegram is received with the polarity defined at this point. Telegrams with another polarity are rejected.
Receiver	Recipient, Text	Specification of the e-mail address of a recipient of the event e-mail. The standard input format of the address is specified as "local@domain" (example: "xxx@yyy.de").
Subject	Subject, Text	"Specification of the subject text of the event e-mail (e.g. "Signalling system fault", "Heater frost protection", etc.). The text may be a maximum of 20 characters in length.
Message	Message, Text	Specification of the the text contents of the event e-mail. The specified contents text is later transmitted to the mail server as 'plain text' in the event mail, and is displayed in the same manner, without special formatting, when the message is opened.

□↵ Signalling system -> Global settings

Arming acknowledgement time [s]	2...3...255	This parameter specifies the acknowledgement time for system arming. Acknowledgement takes place using the "Arming acknowledgement" object and, in the case of external arming, additionally using the visual alarm (depending on the parameter "Optical acknowledgement for external arming"). It is possible to cancel arming acknowledgement by unarming before the arming acknowledgement time has elapsed.
Unarming acknowledgement time [s]	2...3...255	This parameter specifies the acknowledgement time for system unarming. Acknowledgement takes place using the "Unarming acknowledgement" object. It is possible to cancel arming acknowledgement by unarming before the arming acknowledgement time has elapsed.

Switching time, internal siren [s]	2...90...255	If a detector within an armed area responds, or a sabotage detector triggers when armed or any detector is found to be missing, the signalling system switches to the "Alarm" status and activates the internal siren. The internal siren is an alarm encoder activated for a set period of time. The system project planner must set the switching length of the internal siren here. The signalling system automatically deactivates the internal siren when the switching time after the triggering of an alarm has elapsed.
Detector poll interval [s]	2...10...255	The signalling system checks that the detectors created in the security areas exist, i.e. that they are still connected to the KNX system and are functioning. The "Detector poll interval", which can be set in this parameter, defines the time between two read telegrams of the panel, i.e. the time between two detector tests. The signalling system polls all the created detector inputs in turn in this way. Example: poll interval: 10 s, 40 detectors have been created. -> A detector is polled every 10 s. After approx. 400 s, all the detectors have been tested. After this, the cycle test is continued again with the first detector. The signalling system tests detectors considered missing cyclically at brief intervals, in order to be able to detect quickly whether or not the detector has reconnected.
Function visible	Checkbox: Yes / No	The display page of the signalling system can be hidden optionally from the visualisation. If this is desirable or necessary, the parameter "Function visible" must be deselected in the configuration software in the global settings of the signalling system. The signalling system is then no longer accessible via the predefined menu structures of the visualisation. It can then only be accessed by means of internal open pages and operated via the communication objects.
Internal arming via the signal page	Checkbox: Yes / No	The system can be internally armed or unarmed using a display element on the "Signalling system" screen page. This parameter can be used to hide the display element for internal arming ("No"

		setting), so that the system can only be internally armed or unarmed using the appropriate communication object.
External arming via the signal page	Checkbox: Yes / No	The system can be externally armed or unarmed using a display element on the "Signalling system" screen page. This parameter can be used to hide the display element for external arming ("No" setting), so that the system can only be externally armed or unarmed using the appropriate communication object.
Arming delay, internal [s]	0...255	The arming delay time, which can be set here, specifies after what time after an arming command ("1" telegram via the "Internally armed" object or pressing of the "Arm" button) the system is actually internally armed. In so doing the signalling system only checks the arming readiness of the security areas after the delay time has elapsed. Should a detector still be active at the end of the arming delay, (e.g. window opened), then arming does not take place. An elapsing arming delay can be cancelled at any time by unarming. The setting "0 s" deactivates the arming delay for the internal arming operation. When setting the time, a time reserve should be planned, so that the user is still able to leave the building area to be secured correctly before actual arming.
Alarm delay time, internal [s]	0...255	An alarm delay can optionally be configured for the internal arming. An alarm delay is often used when the switching device (e.g. the device or a button sensor) is installed in the secure area. In such cases, authorised people must be able to enter the secured building area, meaning the status the switching device for unarming can only be reached after a delay. This parameter sets the internal alarm delay time. The setting "0 s" deactivates the alarm delay for the internal arming operation.
Prealarm, internal	No Via internal buzzer Via object Via object and internal buzzer	Optionally, if an internal alarm delay time is running during system operation, a "Prealarm" can be activated first. Depending on the parameter configuration, a prealarm is signalled

		here by the acoustic signal generator of the device and/or a separate 1-bit object. During a prealarm, an authorised person can unarm the system without triggering a 'real' alarm. The transition to the "Alarm" status only takes place is the system is not unarmed during the prealarm. This parameter only has an effect when an internal alarm delay time is configured to greater than "0 s".
Arming delay, external [s]	0...255	The arming delay time, which can be set here, specifies after what time after an arming command ("1" telegram via the "Externally armed" object or pressing of the "Arm" button) the system is actually externally armed. In so doing the signalling system only checks the arming readiness of the security areas after the delay time has elapsed. Should a detector still be active at the end of the arming delay, (e.g. front door not closed or window opened), then arming does not take place. An elapsing arming delay can be cancelled at any time by unarming. The setting "0 s" deactivates the arming delay for the external arming operation. When setting the time, a time reserve should be planned, so that the user is still able to leave the building to be secured correctly before actual arming.
Alarm delay time, external [s]	0...255	An alarm delay can optionally be configured for internal and external arming. An alarm delay is often used when the switching device (e.g. the device or a button sensor) is installed in the secure area. In such cases, authorised people must be able to enter the secured building area, meaning the status the switching device for unarming can only be reached after a delay. This parameter sets the external alarm delay time. The setting "0 s" deactivates the alarm delay for the external arming operation.
Prealarm, external	No Via internal buzzer Via object Via object and internal buzzer	Optionally, if an external alarm delay time is running during system operation, a "Prealarm" can be activated first. Depending on the parameter configuration, a prealarm is signalled here by the acoustic signal generator of the device and/or a separate 1-bit object.

		During a prealarm, an authorised person can unarm the system without triggering a 'real' alarm. The transition to the "Alarm" status only takes place is the system is not unarmed during the prealarm. This parameter only has an effect when an external alarm delay time is configured to greater than "0 s".
Visual acknowledgement on external arming	Checkbox: Yes / No	If the system has armed successfully, acknowledgement may take place via the visual signal encoder. This means that it is possible to detect clearly whether the system has responded to an arm command as required or not. This is particularly important when the system is operated remotely - without seeing the device- or in the case of an arming delay. When set to "Yes", this parameter enables visual acknowledgement. The length of acknowledgement is defined by the "Arming acknowledgement time" parameter.

☐↵ Signalling system -> Interior security area / External skin security area -> <Detector>

Identifier	Detector, Text	A detector can be assigned a detector text here, which then clearly identifies the detector. This text (e.g. "Kitchen window", "Garage door"), and later during system operation, is either displayed in the detector list on the device screen or in the event memory if there is activity on the part of the detector, an alarm or a fault. Optionally, if there is an alarm, the detector text can be transmitted to the bus using separate 14 byte communication objects.
Detector type	Contact Movement Glass break	The detector type of a detector (contact, movement, glass break) is specified here. The configured type only specifies the text display in the detector list and has no further effect on the behaviour of a detector.
Input active on	1 telegram 0 telegram	This parameter can configure each detector input to different telegram polarities, i.e. the detector can be active with a "1" telegram or a "0" telegram. The polarities configured in the signalling system must agree the edge parameters of the bus subscribers to

which the detectors are connected.

□↲ Fault messages -> Fault messages -> <Fault message>

Activation by object value	0 telegram 1 telegram	This parameter defines upon which object value the fault message is activated. The inverted object value exits the fault message.
Text of fault message	No presetting, Text	A text can be entered here, which is displayed both in the message window and, if required, is logged in the message list.
Text, line 2	No presetting, Text	The second line of the display text of the fault message in the message window can be specified here.
Text, line 3	No presetting, Text	The third line of the display text of the fault message in the message window can be specified here.
Display external text on fault message	Checkbox: Yes / No	If this parameter is set ("Yes"), an additional 14-byte object becomes visible, which can receive a text message. This text is then also displayed in the message window. To receive this external text, the display of the message window is delayed internally.
Record sender address	Checkbox: Yes / No	The physical addresses of the devices, which have activated or deactivated a fault message, can be recorded in the message list.
Open message window	Checkbox: Yes / No	It is possible to specify here whether a message window is also displayed when a fault occurs. If the message window is displayed, the signal can be acknowledged there.
Acoustic signal	Checkbox: Yes / No	This parameter determines whether the device outputs a signal via the signal encoder when there is an active fault message. It is useful to use this acoustic signalling function if fault messages should signal important events or states to the user of the device. In this case, it is advisable to use short and

		understandable signal tones.
Allow acknowledgement on touchscreen by user	Checkbox: Yes / No	A fault message can optionally be confirmed internally via the control surface "Acknowledge" in the message window (internal acknowledgement). This parameter defines whether an internal acknowledgement by the user directly on the device is possible.
Transmit value on acknowledgement	Checkbox: Yes / No	With internal acknowledgement, this parameter makes it possible to define whether or not an acknowledgement telegram is additionally transmitted to the bus. Parameter not set ("No"): When the operating element is pressed, the acknowledgement is only processed internally. No information is sent to other devices. Parameter set ("Yes"): An additional "acknowledgement object" is made visible. When the operating element is pressed, the acknowledgement is also sent to other devices via this 1-bit object. The telegram polarity of the acknowledgement object can be configured. This parameter is only visible if an internal acknowledgement is allowed.
Value	0 telegram 1 telegram	This parameter is only visible if a telegram should be transmitted to the bus during an internal acknowledgement. It defines the telegram polarity of the acknowledgement telegram.
Allow external acknowledgment	Checkbox: Yes / No	An additional 1-bit communication object can be enabled for implementing external acknowledgement by this parameter. If the parameter is set, a fault message can also be acknowledged by other KNX devices via the acknowledgement receipt object.
Acknowledgment by	0 telegram 1 telegram	This parameter is only visible if an external acknowledgement is allowed. It defines the telegram polarity of the external acknowledgement telegram.
Entry in message list	Checkbox: Yes / No	If this parameter is set ("Yes"), a fault message is logged in the message list.

Enter incoming	Checkbox: Yes / No	If this parameter is set ("Yes"), an incoming fault message (fault message activated) is logged in the message list together with the time. This parameter is only visible on "Entry in message list = Yes".
Enter going	Checkbox: Yes / No	If this parameter is set ("Yes"), an outgoing fault message (fault message deactivated) is logged in the message list together with the time. This parameter is only visible on "Entry in message list = Yes".
Enter acknowledged	Checkbox: Yes / No	If this parameter is set ("Yes"), the acknowledgement of a fault message is logged in the message list together with the time. This parameter is only visible on "Entry in message list = Yes".

□↵ Scenes -> Global settings

Saving by extension	Disabled Enabled	This parameter enables the save function of the light scene function. In the "Enabled" setting, new light scene values can be saved during operation of the device by receiving save telegrams via the extension object. In the "Disabled" setting, it is not possible to save new values using the extension object.
Delay between scene telegrams [ms]	50...100...500	The recalling of scenes can quickly cause a higher bus load especially if many functions were assigned to a scene. To avoid an excessive bus load, a time delay between scene telegrams can be configured here. The transmission of telegrams in the course of the storage function always takes place immediately.

□↵ Scenes -> Scene function -> <Scene function>

Type	DPT 1.001 (1-bit switching) DPT 5.001 … 5.004 (1-byte relative value) DPT 9.001 … 9.021 (2-byte – value)	Scene functions can be configured alternatively to the data formats "Switching", "1-byte value" and "2-byte value" by this parameter.

Icon for 1	Icon selection	Icon template of the switching state "1" (ON) for the status indication of the user settings directly on the device.
Icon for 0	Icon selection	Icon template of the switching state "0" (OFF) for the status indication of the user settings directly on the device.
Image text for 1	ON, Text	Image text template of the switching state "1" (ON) for the status indication of the user settings directly on the device.
Image text for 0	OFF, Text	Image text template of the switching state "0" (OFF) for the status indication of the user settings directly on the device.
Format	# #,# #,## #,###	Setting of the visible decimal places for formatting the user settings directly on the device.
Display format	Percent (%) Degrees (°) User-defined	With the datapoint type "DPT 5.001...5.004" the display format for representing the user settings directly on the device can be defined by this parameter.
Unit	%, Unit selection	Setting of the unit of the editable value with the datapoint type "DPT 9.001...9.021" for formatting the user settings directly on the device.
Offset	0	Setting of the value offset with the datapoint type "DPT 9.001...9.021" for formatting the user settings directly on the device.
Factor	1	Setting of the value gain with the datapoint type "DPT 9.001...9.021" for formatting the user settings directly on the device.
Minimum value	Value	Setting of the adjustable minimum value with the data point types "DPT 5.001...5.004" and "DPT 9.001...9.021"

		for restricting the user settings directly on the device.
Maximum value	Value	Setting of the adjustable maximum value with the data point types "DPT 5.001...5.004" and "DPT 9.001...9.021" for restricting the user settings directly on the device.

☐↲ Scenes -> Scenes -> <Scene>

Value	0 telegram 1 telegram	The switching command of the scene can be predefined here. This parameter is only available for data point types "Switching".
Value	Value	The value of the scene can be predefined here. The settable value range depends on the formatting of the value of the scene output. This parameter is only available for data point types "Value".
Active	Checkbox: Yes / No	If the state of an actuator group is to remain unchanged during the recall of a scene, this parameter can be deselected (setting "No"). In this case, the device does not transmit a telegram via the scene output concerned during the recall of the scene. The scene output is deactivated for this scene.

☐↲ Presence simulation

Identifier	Function, Text	Predefined designation that only appears in the configuration software, identifies an input more exactly and can be modified as required.
Data point type	DPT 1.001 (1-bit switching) DPT 5.001 … 5.004 (1 byte relative value)	The data type of a recording object of the presence simulation can be set here.

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fake sendmail for windows

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5 Appendix

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